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DE FOREST

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SPARKS JOURNAL

★★★★ SOCIETY OF WIRELESS PIONEERS, INC. ★★★★★

POLDHU



MARCONI



RECORDING THE EARLY HISTORY & DEVELOPMENT OF THE WIRELESS

VOLUME 6, NO. 2 [DECEMBER 1983]

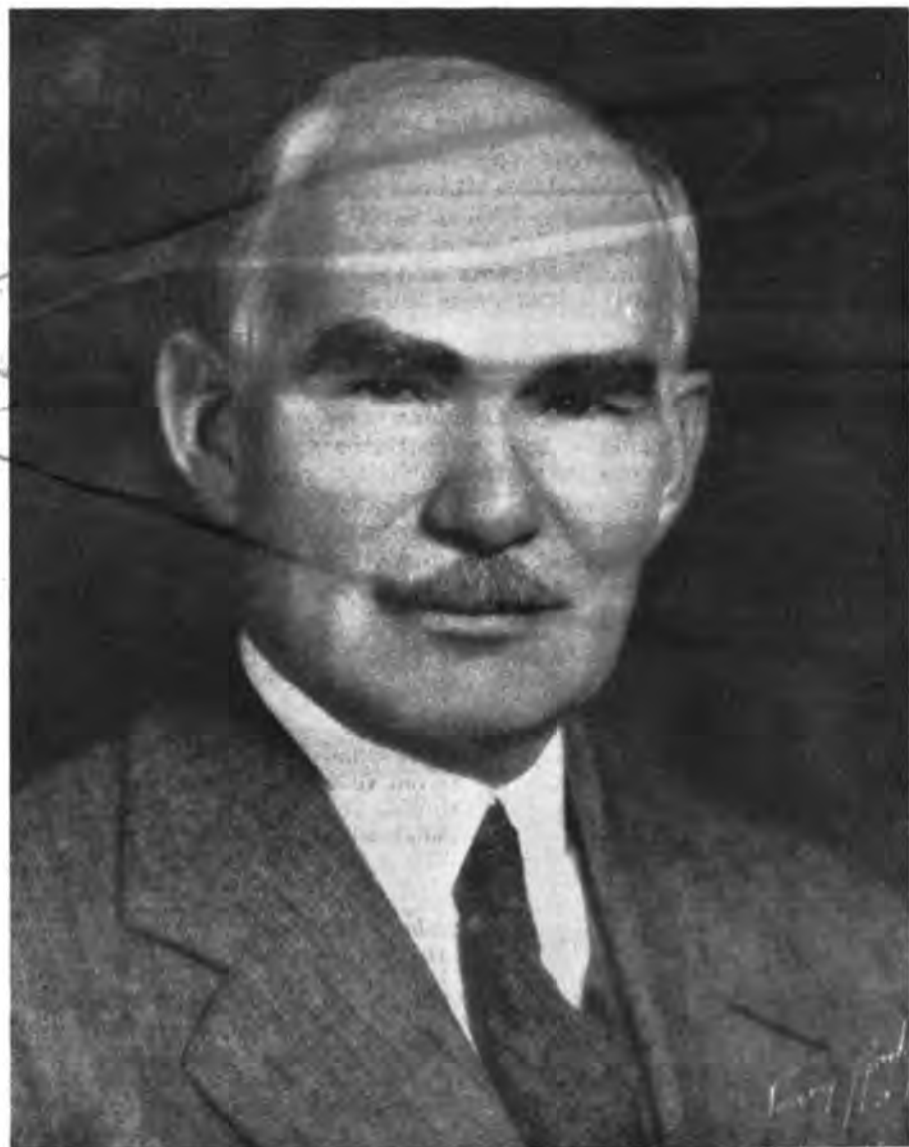
- QUARTERLY -

DR. LEE DeFOREST EDITION

HAILED AS "ALADDIN'S LAMP" OF COMMUNICATIONS

Magic of deForest's Invention Sweeps the World

AUDION NAMED AS ONE AMONG 20 OF WORLD'S GREATEST INVENTIONS



Honorary President, Commercial Radiomen's Association 1931 - 1933. Dr. deForest was a legendary friend of the operator and technician. Story Page 3. Photo - Maria deForest to WAB.

Dr. Lee de Forest

THE FATHER OF RADIO

A New Era of Electronics

- By -

*Henry W. Dickow**

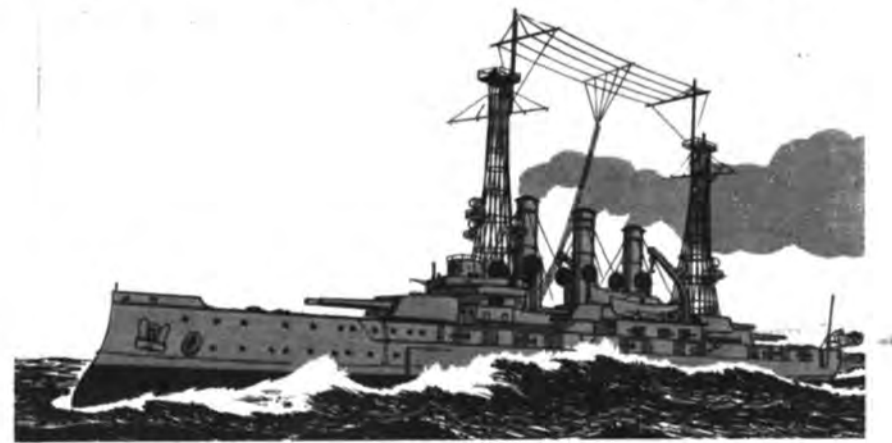
While Guglielmo Marconi is credited with being the Father of Wireless, it is undisputed that Dr. Lee deForest is the Father of Radio.

These two great inventors were compatible. Marconi's discoveries gave the world the wireless telegraph and wireless telephone, a true means of communicating through space without the aid of wires. The first decade of wireless belongs to Marconi, crude as some of his early apparatus might have been. The second decade belongs to Dr. Lee deForest, whose first invention, the vacuum tube, called the Audion, revolutionized not only the science of wireless communication but ushered-in the new era of electronics.

Marconi's invention was limited to communication; deForest's was all-encompassing, for it not only removed the lethargy from wireless but gave the world an entirely new tool which was useful for countless purposes and services other than wireless.

The distinction between wireless and radio can be clearly defined and drawn with the advent of the deForest Audion. Not only was extremely long distance communication with relatively low power made possible with the advent of the "Magic Lamp of Radio" but other communication services were likewise benefitted. The trans-continental telephone of the Bell System, for example, could not have succeeded but for the vacuum tube of deForest. And it is needless to mention here the countless new electronic devices and systems, including the space age, which were made possible solely because of Dr. Lee deForest.

(Continued on Page 4)



De Forest wireless on first naval vessel. U.S.S. Connecticut



SPARKS JOURNAL USPS 365-050

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Founded 1968 by William A. Brennan

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Early Days of The Wireless



IN THIS EDITION

DE FOREST MEMORABILIA

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PICTURES AND ILLUSTRATIONS: 84 Plus.

The following was taken from an old YL Beem (South African) YL club paper and the A.R.N.S. (Amateur Radio News Service).

Seeing is believing:

- Have you ever seen a quarter wave?
- Have you ever seen a volt age?
- Have you ever seen a center tap?
- Have you ever seen a band pass?
- Have you ever seen a net work?
- Have you ever seen an element beam?
- Have you ever seen a negative lead?
- Have you ever seen a filter choke?
- Well, have you ever?
- That's it for now 73/33/88/ as the case may be.

Cathy Hrischenko
VE3CJH



URGENT!

Ship-to-Shore Memo





SOCIETY OF WIRELESS PIONEERS INC

Our Wavelength — Preserving Communications History

THE FOUNDER'S PAGE



The "Ancient Mariner" and Skipper — SOWP

Season's Greetings



*Let peace encircle all the world
Let men walk hand in hand
A Living Bond of Brotherhood
A voice from land to land*

Sincere Greetings to all of our members and friends around the world -- on land, in the air or across the Seven Seas ... Wherever you may be.

Our handclasp of friendship and good-will, and the best wishes from us all for your good health and happiness in the months and years ahead.

" 73 " from the Staff of "SOWP"

William A. Breniman - Founder

SLOP CHEST ITEMS

This is to advise all LABELS are now in stock. NEW LAPEL PIN also as shown by enlarged illustration right, now available. Tab is \$5.00 plus 50¢ if you wish insured. (Calif. tax extra to CA members. All items sold on satisfaction guaranteed basis we will replace or refund if not okay in 30 days. You will like these pins.



ABOUT THE DR. LEE deFOREST ISSUE

Not mentioned among the stories you will read is that the United States Government dedicated a postage stamp commemorating the de'Forest Audion. First date of sale was June 5 1973 at Hemet, Calif. where Maria, wife of the late inventor was invited to preside at the sale of the first issues which were 11¢ Airmail.

Mr. Kenneth Richardson, Secretary of the DeForest Pioneers, Inc., was the individual who should perhaps be given greatest credit in taking care of all the background effort necessary for its issue. This stamp is on in a series of the "Progress in Electronics" series of four stamps. We are happy to report that we gave our support to Mr. Richardson 1972 and 1973 when he was trying to persuade the Post Office to strike the series. The stamp is pictured above.

Commemorative Stamp Honors deForest



Regretfully there is never sufficient space in our publications to include everything we would like to publish. This is especially true with this issue Honoring Dr. Lee deForest. "Ye Ed' met "Lee" several times during his life, hence his impact on my memory is perhaps a little sharper than that of Marconi, Hertz and other "greats" in our historical family. During the early 1930's, Lee deForest, Gilson V.V. Willets (Radio Red) -- SOWP's first Historian, and I all contributed a column per issue in an early day pioneer operator's paper called "CQ". The paper has long since ceased publication but I have kept the historical material published by Dr. deForest and will reprint as time permits.

I might say in passing that I felt Dr. deForest was perhaps one of the most 'humane' of employers in our business and I had the greatest of respect for him.

DUES FOR 1984

This is a reminder to members who have not sent in their 1984 dues that fee is due in January. The tab is still \$10 per calendar year ie 1984 or \$25.00 for 3 years in advance. We will appreciate receipt of same without billing as it cuts our work materially.

Members realize that we accept no paid advertising, hence financing is from dues only. Your assistance with donations will help out a lot in helping provide publications to less fortunate members whose pensions will no longer stretch or those ill or have had major misfortunes. We also have a number of vital projects that we could like to complete which require additional funding. Any help within your means will be very much appreciated.

THANKS

I do wish to take this occasion to thank members who have volunteered their help and assistance through the past year. This includes of course Chapter officers as well as those on our nets. It also includes those on our Board of Governors, Staff and Headquarter officials including our President, Vice Presidents plus all members who have done so much to promotion. I am sure one couldn't ask for more cooperation and help than we have had. The continuing growth and interest attest to the fact.

FAILING EYESIGHT ?

Many of our members are in their Senior years and experience some problem in reading of smaller print. We have been able to procure some Page Sized Magnifiers which lets you read small print without eyestrain and without fuss. Size permits reading a full column or an entire 7" x 10" page. The thin-plastic is lightweight and unbreakable and comes in a sealed vinyl frame for easy hanging. These normally sell for about \$5 each. We can supply a limited number at \$2 each plus 60¢ for mailing. Orders accepted on our supply basis. California tax .12 each in California should be added.

DICKOW'S HISTORY OF THE WIRELESS TELEGRAPH

Historical Paper

(Continued from Page 1)

de FOREST - "Man of Destiny"—By Dickow

Ironically, in recent years the vacuum tube has given way to the transistor, a device developed and perfected by the very people who first enjoyed their greatest successes with the aid of the deForest invention. And in due time the transistor of the Bell Laboratories will give way to newer and better devices.

The expression radio came into general use almost simultaneously with deForest's discovery of the vacuum tube. It was called a radio tube and not a wireless tube because its construction included a number of wires - one for the grid, one for the filament, and the usual connecting leads which protruded through the glass bulb or envelope. It was never referred to as a wireless tube in America, although the British still call their tubes wireless valves, or radio valves, depending on the services they render.

THE DISCOVERY OF THE deFOREST AUDION

The deForest radio tube was not an accidental discovery by any stretch of the imagination. It was developed by slow and often discouraging methods of cut-and-try.

As early as 1900, while deForest was experimenting with the first form of electrolytic detector used for wireless communication, he found that the light from a Welsback burner would flicker, grow dim, then brighten, when a spark was made to appear between the gap of his induction coil. At first he believed this phenomenon to be of an electro-magnetic nature, but to his disappointment he found that it was due merely to an acoustical condition. Nevertheless, it inspired him to experiment further with his "gas-flame" detector, which consisted of a pair of electrodes suspended above the flame of a Bunsen burner. Next he inserted two filaments in a common glass bulb or envelope, then he tried a filament and two platinum plates. None of these devices proved more sensitive than the two-element Fleming Valve invented by Professor Sir John Ambrose Fleming of England. This valve consisted merely of a heated filament and a plate.

The great discovery of Dr. deForest came when he inserted a grid, or a zig-zag platinum wire between the filament and plate of a vacuum tube, thereby making it a three-element device. The control grid, as it is called, allows a stream of electrons flowing from filament to plate to be controlled by external means. The first grid was a small metal plate with many small perforations, but it was quickly replaced by the zig-zag wire grid, not much different than the grids found in radio tubes of the present era.

The deForest Audion was discovered in 1906 and was patented in the following year under the serial number 841,378 U.S. Patent Office, January 15, 1907.

Dr. deForest has stated, and others are in general agreement, that this was one of the most valuable patents ever issued by the U.S. Patent Office.

No better description of his invention has ever been written than that of Wilbur B. Driver of Newark, New Jersey, who says as follows:

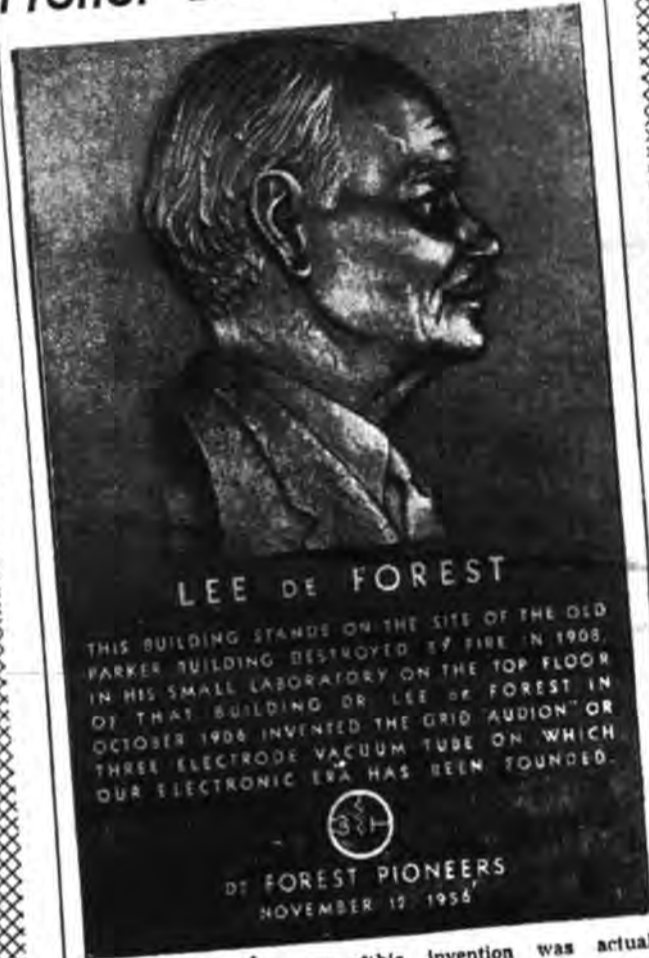
"Of all the creations shaped by his genius, Dr. deForest's 3-element grid Audion tube - the miracle seed responsible for the swift growth of electronics - best reflects his enormous gift to mankind. To understand this vastness, measure the laughter of every motion picture, television and radio audience...tally the wages earned by millions, from solderer to screen star...appraise the value of the lives spared in wartime and protected in peacetime...and add those seemingly limitless electronic inventions fathered by the precious Audion. And though you calculate all these through generations yet unborn, even to infinity, the resultant figure is but a fraction of the contribution's total true value."

Said ex-President Herbert Hoover: "...to honor an inestimable benefactor of mankind...He will be remembered when all the rest of us are forgotten."

(Continued Next Page)

New York World-Telegram
and
The Sun
A SCRIPPS-HOWARD NEWSPAPER.
NEW YORK, MONDAY, NOVEMBER 12, 1956.

Electronics Pioneers Honor Dr. de Forest



The fiftieth anniversary of his invention was actually made. Rear Adm. Ellery W. Stone, president of the De Forest Pioneers, presided. Among those attending were Brig. Gen. David Sarnoff, who addressed the group which included many of the engineers who were associates of Dr. de Forest in his pioneer work in the art of radio communications. Also present were representatives of the six companies which contributed to the plaque, all of them typical of the growth of the electronics industry. The companies are: Bell Telephone Laboratories, Inc., General Electric Co., International Telephone and Telegraph Corp., Radio Corp. of America, Sylvania Electric Products Inc., and United Electronics Co.



De Forest first "disk jockey" in his New York studio—1911

1952 - DR. LEE deFOREST ON HIS 80th BIRTHDAY

(Continued from Page 4)



"QUIET HAVEN" on the Russian River

This picture was taken in 1952 on the 80th Birthday of Dr. Lee deForest. Dr. deForest pictured right, wife and companion Maria left with lifelong friend Gilson "Rex" Willets of Villa Grande center. The home of "Rex" was in a sylvan rustic retreat of redwood trees fronting the river. It was a favorite haven for the deForests when they wanted to get 'away from it all'.

"Radio Rex", as he was known to his many friends said that on this occasion - for the first time, Dr. deForest refused to discuss the transistor and its application --- "just wanted to hear nothing at all about it".

"Rex" was a Charter member of the Society of Wireless Pioneers (S-SGP-22); also the Society's first Historian. Following his first assignment in 1913 on the SS El Oriente KKV he sailed for many years on both East and West Coasts. Experience included several broadcast station positions including that of Manager of WOS/WOC in New York City as well as Chief Operator at WRNY, WDBO and KFWL. He was a columnist for the Scripps-Howard Newspapers for several years. He was one of founders of VWOA and a lifelong member of the "deForest Pioneers. Rex became a silent key Jan. 7 1976 in Sebastopol, Calif.

During the course of his long and productive lifetime he secured almost 300 patents covering various wireless, radio, and electronic circuits and innovations. He made and lost three fortunes. The costs of patenting his many ideas were extremely high, as any inventor knows. And the additional costs of protecting his discoveries and defending himself through scores of court actions, deprived him of all his wealth.

His discovery of the Audion came at a time when his fortunes were at a low ebb. He had previously founded the deForest Wireless Telegraph and Telephone Company, in which stock was publicly sold. And without his knowledge, several of the officials of his company engaged in unscrupulous practices which resulted in their arrest and conviction. Dr. deForest was charged with the others and remanded to trial. It was his darkest hour, for he himself was wholly innocent of any wrongdoing. He was merely the inventor of new wireless circuits, and he was wholly unaware of the methods employed by promoters to sell the shares of the stock in his company. The jury acquitted him, but found others of his company guilty.

Once when he was in dire need of funds, and at a time when he went without meals, sometimes for several days, he was approached by an attorney who expressed an interest in his vacuum-tube amplifier invention. Suspicious that the man was a representative of one of the large corporations, deForest first elicited from him a solemn pledge that such was not the case. Taking the attorney at his word, deForest signed over one of his priceless patents for a pittance (\$50,000) not knowing that he could have been paid \$450,000 had he held out for this amount. After the deal was signed, sealed, and delivered, he learned to his consternation that the attorney was in fact a representative of the Telephone Company.

He saw his audion amplifier tube used during 1915 when the first trans-continental telephone conversation was conducted between Washington and San Francisco to commemorate the open-

ing of the 1915 Panama-Pacific International Exposition. The demonstration was made literally under his own nose, for he himself had an exhibit almost adjacent to where the telephone demonstrations were being held. No mention was made of the use of his audion amplifier, nor were the people told that the success of the venture was due in great part to the deForest discovery.

His pride hurt, he fought back. Each time a transcontinental conversation was consummated, he announced by printed notice and spoken word that the deForest vacuum-tube amplifier made the achievement possible, and in his own booth he explained how the feat was accomplished.

One of the men who knew him best was Gilson V. (Rex) Willets of Villa Grande, California, on the Russian River, where Dr. deForest and his gracious wife spent much of their spare time in the late years of the inventor's life. Willets first came to know deForest when he sought employment in his High-bridge, New York, experimental laboratory.

"I wanted to be close to this great man," said Willets, "And I hoped that some of his genius would rub off on me."

Asked to relate his innermost thoughts of deForest, Willets countered by saying that he was really three men in one, lived three separate and distinct lives; made and lost three fortunes, wooed and wed four women, the last of which was the beautiful motion-picture stunt actress Marie Mosquini, the greatest asset of his long and colorful life. She was many years his junior, yet they lived an idyllic life. She was his inspiration in his sunset years. He never stopped inventing. Among his last projects were those related to the production of electrical energy by thermal means. He foresaw light, heat, and power from new untapped sources of thermal energy - for the home, the plant, and in all other forms of human endeavor.

(Continued on Page 6)

LIEUT. WEAVER USING RADIO PHONE ON THE USS CONNECTICUT



LIEUT. WEAVER USING RADIOPHONE ON THE CONNECTICUT

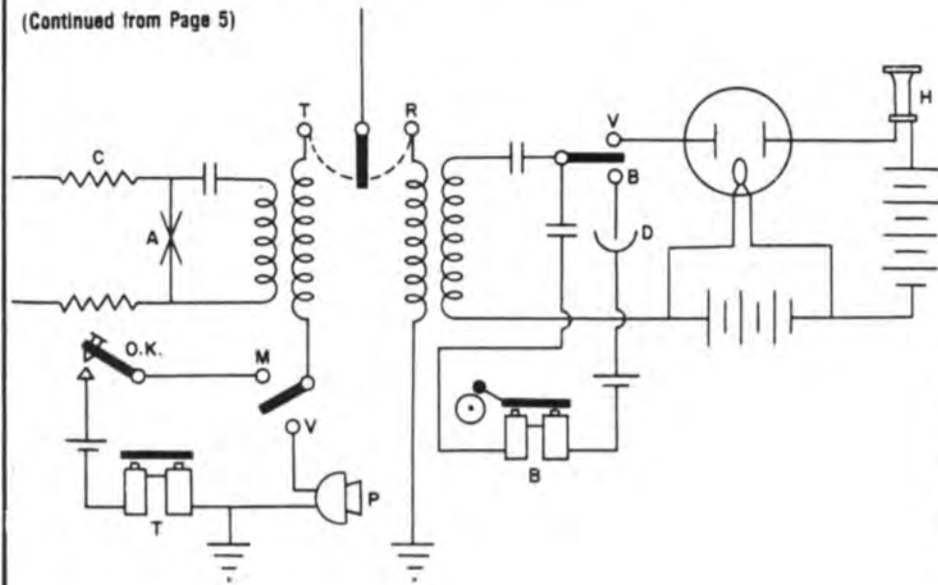
Lt. Comdr. Cleland Davis became head of the Radio Division of the U.S. Navy in 1906. During the summer of 1907 he ordered two sets of de Forest equipment which were installed in the Battleships U.S.S. Connecticut and Virginia.

Apparatus test on trials in September were fairly successful so 26 more sets were purchased to equip the ships of the famed "Around the World Cruise" of Admiral Evans, wcheduled to depart Hampton Roads, Va. on 26 December 1907. Only 40 days were allowed for delivery of these sets which were mostly hand-crafted, hence malfunctioning was found in many units after installation by ships crews, mostly following departure.

Pictured above is Lieut. Weaver of the USS Connecticut at the microphone of a Navy-built transmitter of the 'Poulsen' type. During the trip, antagonism developed because the same frequencies used for regular communications were also used for radio-telephone contact with resulting 'jamming'. Finally Admiral Evans ordered most of the sets dismantled and antennas taken down. One of his reasons was that there was ... "too much playing with the new toys". The installation on the USS Ohio was exempted however and the equipment was used by the fleet to allow members to 'tune-in' band concerts from the Ohio at periodic intervals. While in many ports, phonographs were played over this set with many favorable reports.

Schematic Diagram of DeForest Radio Telephone Sets Purchased By The United States Navy, 1907

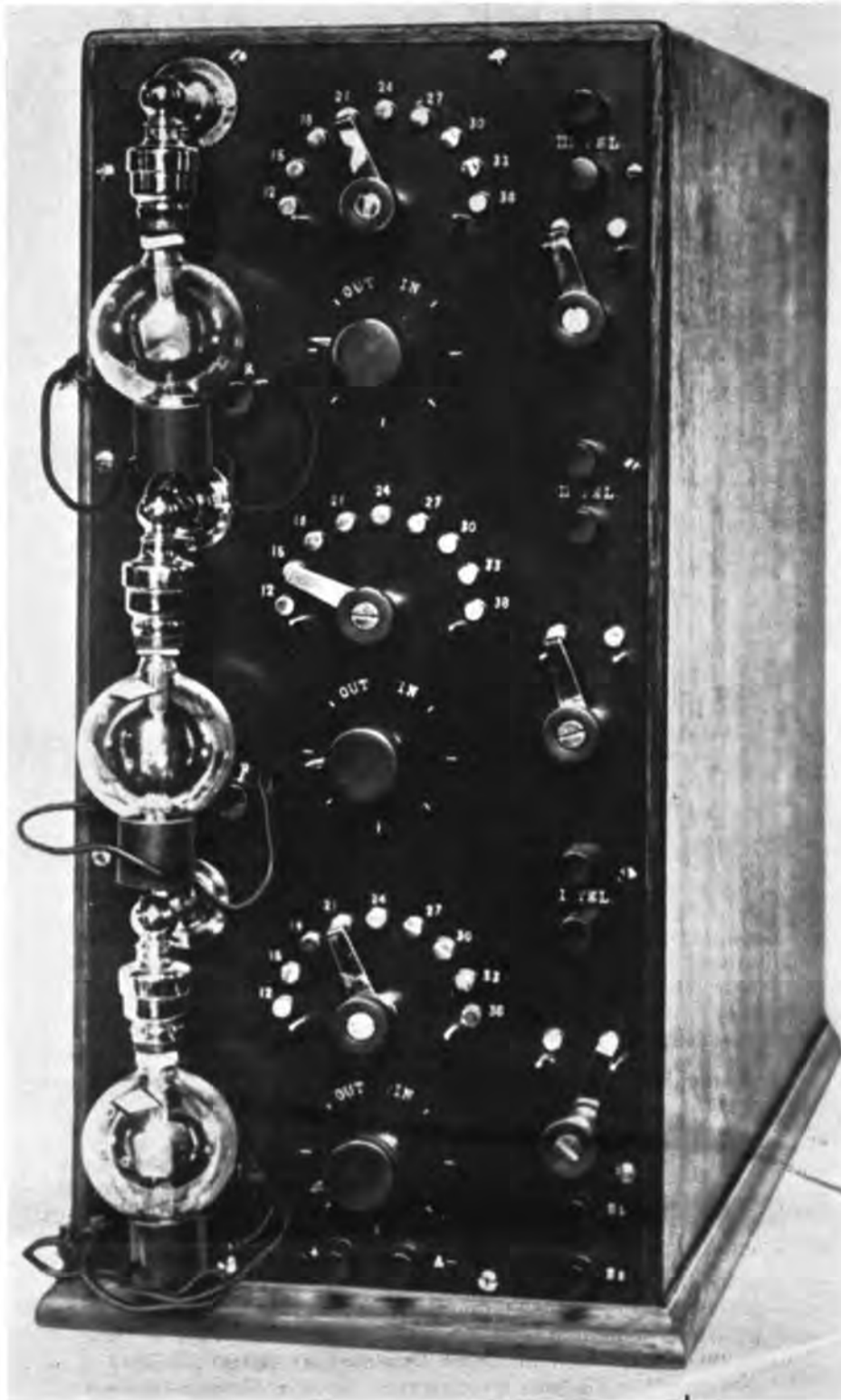
(Continued from Page 5)



- A - ARC
- C - CHOKE COILS
- T - TIKKER
- M/V - CALL-CODE/VOICE SWITCH
- O.K. - OPERATOR'S MORSE KEY
- P - MICROPHONE
- T/R - ANTENNA TRANSMIT-RECEIVE SWITCH
- Y/B - VOICE/CODE-CALL SWITCH
- H - TELEPHONE RECEIVER
- D - CRYSTAL DETECTOR FOR CALL CIRCUIT
- B - CALL BUZZER

Reconstructed from Information Contained in Robison's Manual of Wireless Telegraphy, 1911 and Other Official Navy Records

EARLY deFOREST AUDION AMPLIFIER



Said Willets: "Unlike other inventors, Dr. deForest did not subscribe to the theory that a patent was merely an invitation to a lawsuit. He defended his inventions vigorously, spending huge sums for the best available legal talent, sometimes to the extent that the costs of such litigation exceeded any remuneration he might have received from the sale of a patent or its royalties.

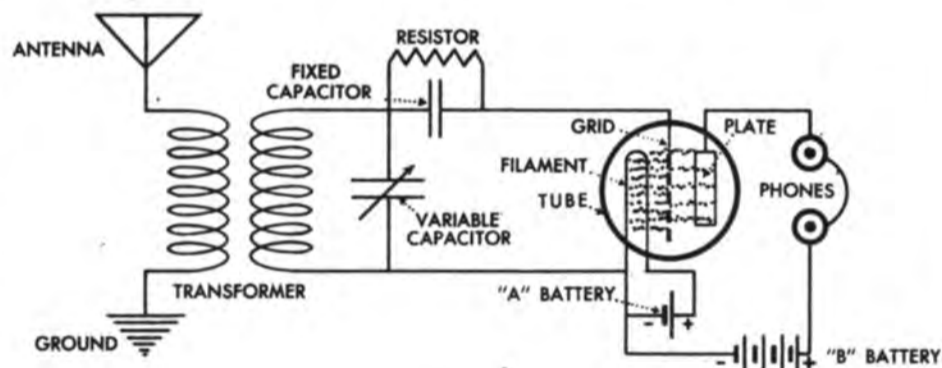
"He seemed never to run out of ideas. They came to him in an endless stream, and he passed them along to his numerous co-workers, assigning to them one task after another.

"We celebrated his 80th birthday at Villa Grande. I noticed for the first time that a change had come over him since the transistor began to replace his vacuum tube in ever-growing numbers. Years ago he lauded the transistor, believing it would merely supplement the vacuum tube, but never replace it. When faced with stark reality, he became embittered for the first time in the more than 50 years that I had known him. 'I do not wish to discuss the transistor,' he scowled, 'And I never want to hear it mentioned again.'"

He was a deeply religious man, a poet, and a philosopher. He was born in 1873 and reared in Talladega, Alabama where his father was president of a negro college. Early in life he displayed remarkable mechanical skill, building steam engines and miniature working models of small locomotives.

In 1896 he was graduated from Yale with a B.S. degree, and then he went onto graduate school. He worked hard to earn the moneys needed for his education; he was stoutly determined to make a success of his life, setting his sights on Marconi. "I have resolved to become a greater man than the inventor of wireless himself," deForest once said

Continued on Page 7)



The Basic Layout of the Audion Tube Circuit Developed by Lee deForest

HEATED FILAMENT INSIDE TUBE GIVES OFF ELECTRONS WHICH NORMALLY FLOW THROUGH GRID TO PLATE. BUT WHEN RADIO SIGNALS FROM THE ANTENNA REACH THE GRID THE NORMAL FLOW OF ELECTRONS

IS VARIED IN STRENGTH. THESE VARIATIONS CREATE A PULSATING CURRENT IN THE PLATE AND PHONES WHICH CORRESPONDS TO INCOMING RADIO MESSAGES OR VOICES AND MUSIC THAT ARE BROADCAST



Equipped with our wireless apparatus, both wireless telephone and sparkless wireless telegraph. Dr. De Forest made the first successful demonstration from a moving boat on this vessel.

When Admiral "Fighting Bob" Evans took his "Great White Fleet" of U.S. battleships on a world cruise, the Navy equipped its ships with deForest wireless apparatus. This was the first time in history that our ships were able to communicate with one another. The year was 1905.

Prior thereto, deForest secured a number of basic wireless patents and formed a company under his own name. The first high-power U.S. Navy shore stations were soon deForest equipped, and he found himself with more business than he could possibly handle.

But in 1906 he was cashiered-out of his own company, and to add insult to injury, was bilked out of his first wireless patents. He did not complain, he never did. Instead, he went ahead with new inventions, and out of the 1906 disaster came his audion tube; this patent he retained for himself under his own name.

By 1920 his "Photofilm" was the miracle discovery of the early motion picture industry, and his later success, the astounding discovery of adding sound to film, was the contributing factor to a new runaway idea in movie-making.

By this time he had moved from his eastern abode to Los Angeles, where he took to mountain climbing as an avocation. To celebrate his 70th birthday, he climbed Mt. Whitney.

The historian for the American Telegraph and Telephone Co. found deForest to be a controversial and complex man, yet brilliant, willful, egotistical, adventurous and poetic. HistrIBUTE to him was expressed in these words: "deForest, through his invention of the audion tube, altered the course of human history. He produced a device which magnified electrical signals, thereby tapping energies whose very existence might otherwise have remained completely unknown."

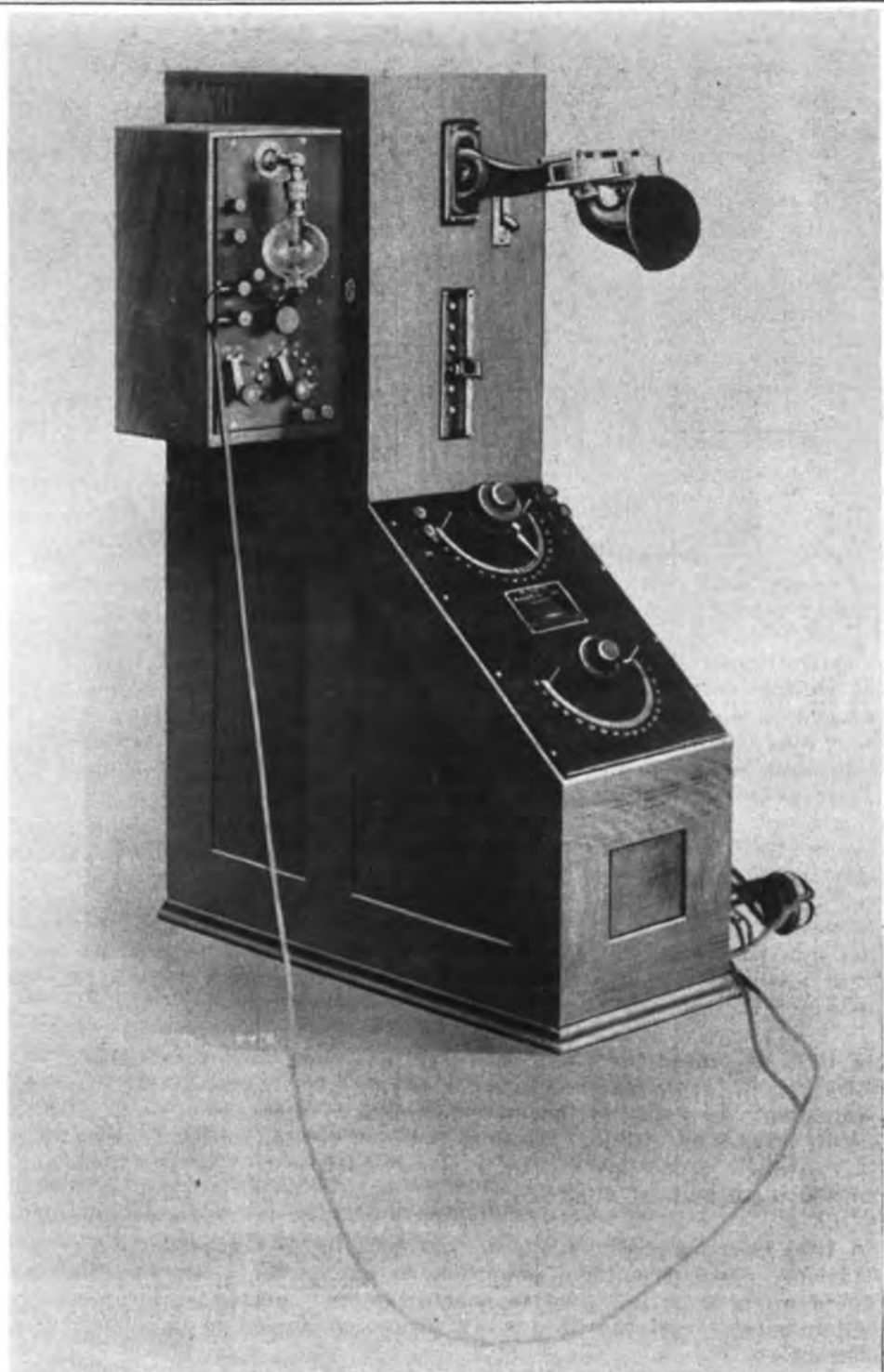
Dr. Lee deForest died on June 30, 1961 at age 87, the victim of a heart attack. Until a few years before his death he maintained a laboratory on the 14th floor of a building overlooking the western headquarters of practically every major radio and television production company...the giant he helped create.

With him when he died was his devoted wife, Marie. She said of him: "He was treated badly by his fellowmen, for whom he did so much. Ours was a most companionable life together; I know at last he need not cope with any more disappointments and hurts. I do not mean to be sacrilegious, but after living with him for so many years, I could not help but see that his life was so very Christ-like. You could rob him in the morning, and in the afternoon if he met you on the street, he would greet you and shake your hand. Lee deForest was not only religious, but he lived a religious life - every day of it."

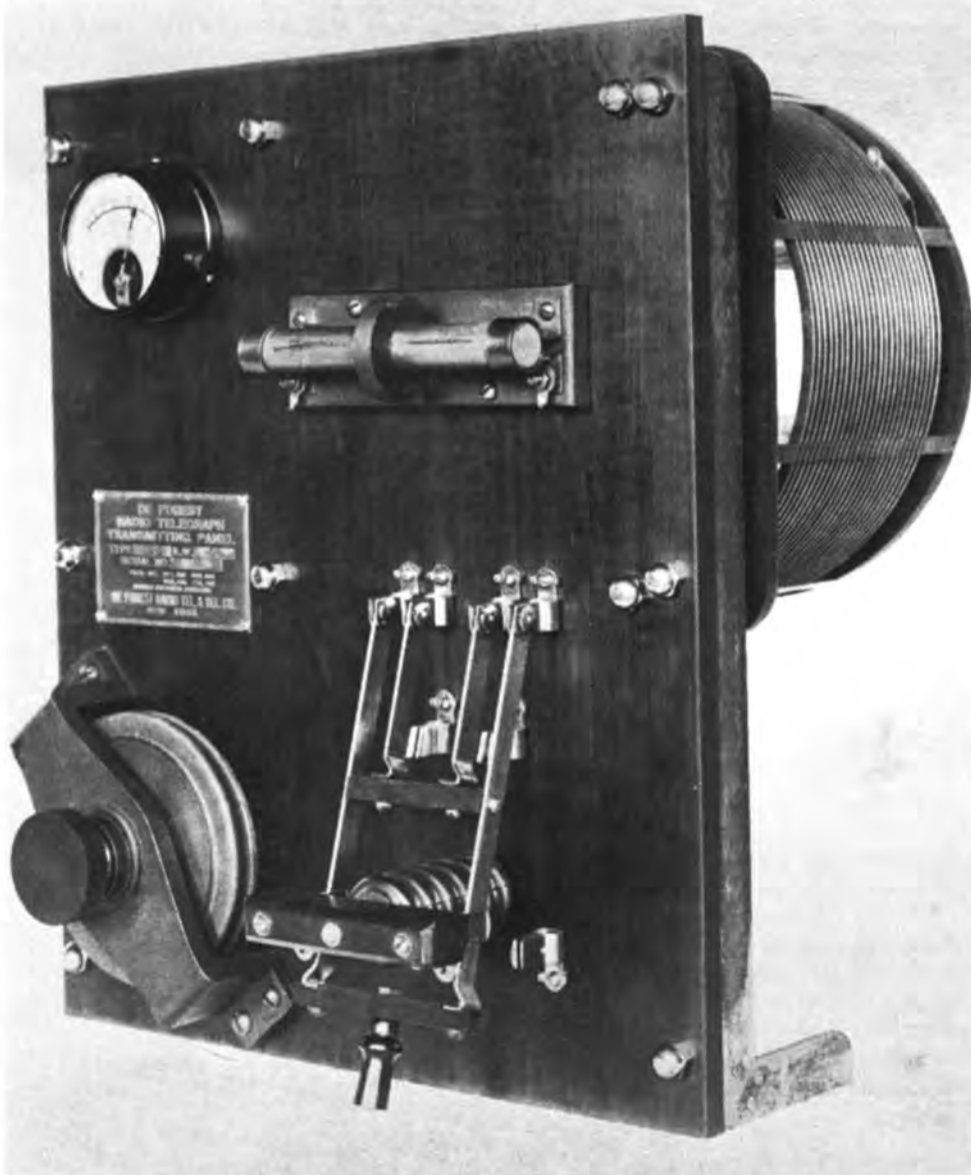
When I asked Marie deForest to state his last words to her, she replied as follows: "The marriage flame in our lives never grew dim." Yes, I do recall his last words to me; they were: "I love you more than tongue can tell."

* * * * *

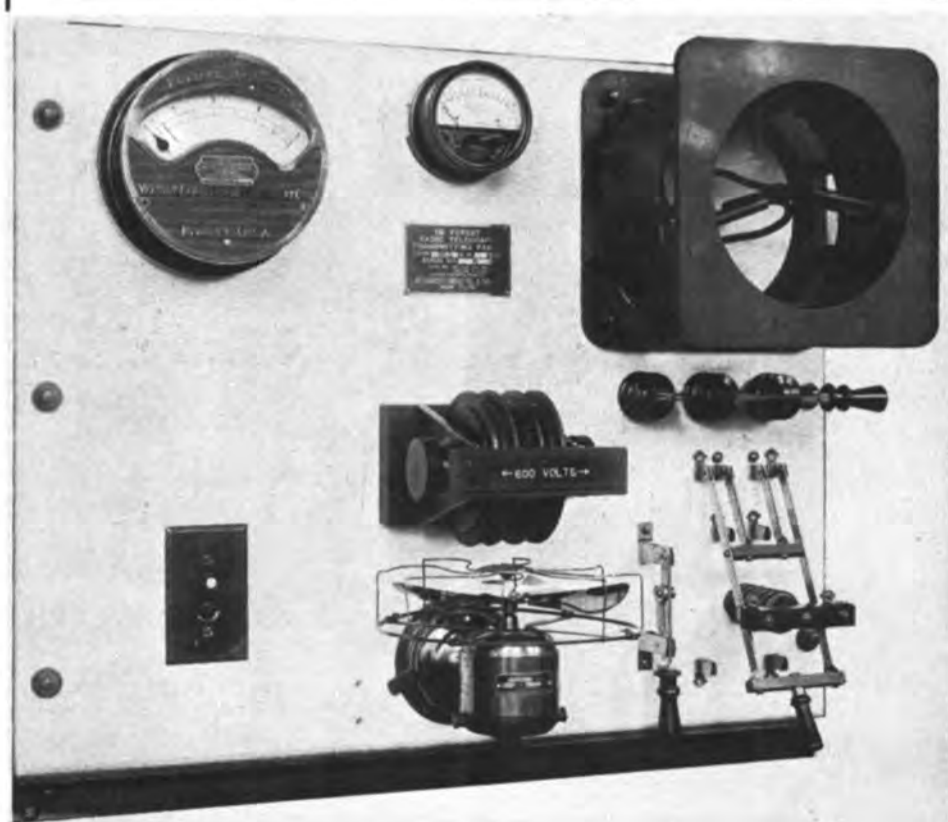
His estate was valued at \$1200, and consisted of a check from American Telegraph and Telephone Co. in the form of reimbursement for the use of his earlier patents.



Control Console for de Forest Radiotelephone, with Audion detector and tuner.



de Forest 100 Watt Arc-type Transmitter. \$450.00 for Commercial Service.



Early de Forest Radiotelegraph Transmitter, 2-KW Arc Type Generator Price \$2000.00 Picture from Dickow Collection.

Dr. Lee de Forest

BY

DEXTER S. BARTLETT

HISTORICAL PAPER

Inventor of Destiny

One hundred and ten years ago, a genius was born to transform crude wireless into the realm of fantastic electronics. We can safely say that he was the greatest of all electronic inventors and ranked high in the top twenty of the world's inventors.

Lee De Forest was born in Council Bluffs, Iowa on August 28, 1873 of clerical parents. However, they were broadminded enough that when Lee was thirteen and trying to invent perpetual motion, they sent him to Yale's scientific school instead of a religious seminary. Lee soon found out the law of conservation of energy and dropped those perpetual motion experiments.

He graduated from Yale with a PH D thesis on the reflection of Hertzian waves, showing his scientific ability.

However, upon graduation the best he could accomplish was an eight dollar a week job. By living very frugally he was able to produce his first invention, the Responder, which was an improved electrolytic detector far superior to the decrepit coherers.

In 1903 he proved that long horizontal antennae were directional. Also in that year, Clifford Babcock became his helper at zero wages and they started the marvelous age of electronics by developing the triode audion. De Forest moved his lab to 27 Thames St. N.Y., which is now marked by a plaque certifying it as the location of the birthplace of electronics.

In 1904 he progressed with navy contracts for five ground radio stations, which gave them something to eat on for a while. Also there was enough left over to enable him to create an interesting wireless exhibit at the St. Louis Fair, which proved to be a big attraction.

There he became acquainted with balloonist Roy Knabenshue, who was willing to help investigating the possibility of the first air to ground communication. Not knowing if such a thing was possible, they hung the antenna up inside the balloon and knowing about counterpoises, they used a bucket of mud for ground. Yep, it worked. With Charlie B. Cooper sending and McQueen in the Balloon copying it all, they made the headlines. Incidentally, C. B. Cooper later was to become the famous Kilbourne & Clarke director of their radio operators.

Also in that year he installed a set on a tug commissioned by the London Times which followed the Japanese fleet and witnessed the demolishing of the Russian fleet, making the first war communique.

In 1905 he started the De Forest Radio Telephone Co. But, he made one very innocent, but serious mistake in logically figuring that as an inventor he had no business ability and so turned the management over to some unscrupulous people, who believed that the easy path was the best. They soon changed the companies name to United Wireless and De Forest lost everything except his patents. Then the managers went into a stock selling that would rival any modern swindle scheme.

As a lad I remember the United Wireless gang coming to our small Minnesota town with big fanfare. They rigged a transmitter at the back of our little theater with a coherer receiver on the stage. Then they would let us press the key and turn on lights and ring bells on the stage. Then the agent went into his sales pitch, telling how the United Wireless would run the Western Union out of business as wireless did not need expensive pole lines, so stock holders would get rich overnight. Farmers thought wireless was the work of the devil. But, the devil or not, they bought the worthless stock.

Anyway, as a fourteen year old kid, the exhibition gave me the wireless bug and I started out my life in what is now electronics.

Naturally all those shenanigans caused De Forest much mental anguish, but United Wireless went bankrupt in 1916 and during the trial De Forest was completely acquitted while those promoters received ten year sentences. The sad part of it was that with about eighty ships stations, plus many land stations, with proper management, it could have been the dominating electronic concern today.

1907 saw De Forest with the first arc radio phone broadcasting system, which had ham and commercial operators for listeners. Although several other inventors had created radiophones by using high pitched spark transmitters, naturally they were of poor quality.

Also in that year they were able to sell twenty-four arc radiophones to the navy for use on their ships in that famous round the world trip of the great white fleet. They had limited success due to inexperienced personnel, but it did lead to other orders, even from foreign navies.

1908 was the start of the electronic age when De Forest and his assistants stuck a little bent wire between the cathode and plate of Fleming's rectifier creating the first triode, or magic lamp, and the world has never been the same since.

1910 found him in the New York Metropolitan Opera House, broadcasting the first opera over his arc radio phone, long before KDKA. De Forest was quite a poet and enjoyed dramatic programs.

1912 found him collaborating with Robert Marriot, E.J. Simon, Fred Kolster, Dr. Alfred Goldsmith in founding the Institute of Radio Engineers and later he was president for a one year term.

Also in 1912 found him in the throes of epic developments. He turned the audion into the far reaching amplifier. His early tubes were gaseous with the inevitable blue glow with too much plate voltage. He had his supplier, Western Electric, furnish a higher vacuum and amplification was on its way.

Also, more or less accidentally, he or his assistants hooked the output of the second stage back to the first stage and produced oscillations and early day squeeling radios were on its way, plus transmitting tubes for this modern day space age.

But, as De Forest often said, "A patent is just an invitation for a lawsuit," and that again is the way it turned out. Major Edwin Armstrong made the same discoveries simultaneously and there ensued a costly and long drawn out lawsuit being carried on, for an extended period.

(Continued on Page 9)



Lee de Forest became the world's first disc jockey in 1907 when he played his favorite number, the "William Tell Overture," in his Parker boulevard laboratory in New York. On the receiving end of the transmission were the U.S. Navy operations at the Brooklyn Naval Shipyard.

DR. LEE deFOREST

De Forest finally won the decision, but the expensive lawsuit found him broke, with even his watch in the pawnshop. In 1934 after this and many other agonizing ordeals, poor Armstrong committed suicide with a brilliant career back of him.

After a long wait he finally sold his audion patent rights, for use on wire lines only, for \$50,000. Although worth millions, he had to take it for living expenses. Of course he still could sell his tubes for radio use.

1914 found him in another lawsuit with Marconi, who again claimed his audion violated the Fleming diode patent. Only his perseverance in keeping going when he knew he was right carried him through those trying days.

In 1916 he originated the first real broadcast station, four years before KDKA. It was in New York City using a 125 watt tube, the biggest in existence. He broadcasted from records and so became the first disc jockey. Also they broadcasted the presidential returns of that year. His listeners consisted of hams plus a few home sets.

1917 again found him a capitalist as he sold all of his audion patent rights to the American Telephone and Telegraph Co. for \$250,000. He still was able to manufacture tubes for governmental and amateur use, which tubes soon found their way in commercial use via bootleggers. That year he sold sixteen tube radio sets to the navy, the first radiophone sets on aircraft.

The De Forest Radio Telephone & Telegraph Co. in 1920, allied themselves with Elmer Cunningham's concern, which relieved a difficult tube patent situation and they were able to manufacture tubes for the commercial market, doing away with the bootleg concerns. They hit the market as the broadcast industry was turning from cat-whisker receivers to tubes. However, to procure money for experimental work he sold his holdings in the company, which ended up in the RCA.

Promptly, he turned his inventive genius to producing moving pictures that talked, or phonofilm as he called it. His was the first with a sound track right on the film doing away with synchronizing problems. As always with new inventions, the old time picture industry turned up their noses at it for being a useless toy.

Luckily in 1922, he was able to sell his patent rights to phonofilm for a reasonable sum, once again putting in clover. The first picture was shown in New York with Eddie Cantor.

Then he slackened off a bit, but did do some experimenting in television, which then was its infancy, but coming on strong.

1931 was the first time in years that he was free from patent lawsuits. High vacuum tube, feedback circuit, oscillator and regenerative patents were all settled in his favor. Better yet, most of the violent animosity was gone from all parties.

Around 1935, he came up with his last important invention, radial TV scanning. Finding it not suitable for TV, he dropped the matter. Little did he realize that with WW-II on radar radial scanning, or PPI-plan position indicator - was very important in winning the war.

(Continued on Page 10)



CHARLES B. COOPER

Seated on the first "Radio-Tail-E-Phone" at Leadville, Colorado in front of the United Wireless Station sits C.B. Cooper ["CBC"] Gathered around the one-mule-power cart are some of the local miners for a bit of 'color'. At rear to right are some of Leadville's leading citizens including the Mayor and Newspaper Editor. The picture was taken in 1905. The year prior, "CBC" assisted Dr. Lee deForest at the Saint Louis Exposition in demonstrating the 'wonders' of wireless. Later Mr. Cooper was an installation man for United and the organized the Ship Owners Radio Service in Seattle, Washing. He was one of the West Coast's best known wireless personalities in the early pioneer days.

Picture furnished from Henry Dickow's collection.



View taken at 150 feet showing one of the earliest Wireless telegraph stations in Canada, the DeForest Wireless Telegraph Co. of Canada station on exhibit at the Canadian National Exhibition during August and September, 1903 at Toronto. Erected by J. Alex Wallace. The operator was Charles Cooper During the Exhibit many messages were exchanged between this station and a similar one erected at Mate Akroyd's Boat House at the foot of York Street, Toronto Bay, a few miles distance.

2.

See another view, close-up showing Dr. Lee deForest in the straw hat, and an interior view of the equipment, showing Cooper at the key, and other views showing erection of the antenna masts at the Bay station.

From collection of Kenneth Richardson, late member 487-SSGP Society of Wireless Pioneers and Secretary DeForest Pioneers, Inc. Furnished by Elmer H. Burgman - 484-P from his collection.



HISTORIC PHOTOGRAPH

Possibly the earliest photograph ever taken of Dr. Lee deForest and his Wireless works which remains in existence today. His wireless telegraph system as exhibited in August and September 1903 at the Canadian National Exhibition, Toronto World's Fair 1903, one of the first radio stations in Canada. Erected by J. Alex Wallace for the DeForest Wireless Telegraph Co. of Canada. Operator was Charles Cooper. During the exhibition many messages were exchanged between this station and a similar station erected at Mate Akroyd's Boat House at the foot of York Street, Toronto Bay. DeForest is shown in the straw hat.

The original photograph from which this copy was made was size 5" X 7" and was yellow with age, and loaned by Mr. Cooper, owner of the original. Photo-copied in November 1953 by Kenneth Richardson (Charter Member of the DeForest Pioneers, and Society of Wireless Pioneers, Inc. - S-SGP-487. Mr. Richardson became a Silent Key in 1979.

Historian Bartlett's Review

(Continued from Page 9)

Then taking up his old inventions of the radio surgical knife and diathermy, he ran into trouble with the FCC for radiating spurious signals and dropped the matter.

Although those wonderful transistors have replaced tubes, yet his little piece of bent wire for a grid certainly gave birth to this marvelous electronic age, where Mariner missiles are still giving readable signals millions of miles out in space. However, he always lamented the fact that his inventions just brought inane, vicious radio and TV programs instead of uplifting ones.

He never really retired as he was issued a patent in 1957 and just went from his lab to his death bed, July 2, 1961.

With over three hundred patents, plus many honorary degrees, including the French Cross of the Legion of Honor, he certainly left behind something besides a cold tombstone, which is the heritage of most of us.

E N D

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DEXTER S. BARTLETT, SOWP MEMBER #145-SGP
 WAS HISTORIAN FOR THE SOCIETY FOR 1970
 TO 1978
 Deceased - March 15, 1982



Interior view of the DeForest wireless station on exhibit during August and September 1903 at the Canadian National Exhibition, Toronto, one of the first wireless telegraph stations in Canada.



Another view showing the erection of the antenna masts for the DeForest Wireless Telegraph Co. of Canada wireless telegraph station at Hamilton Bay (Burlington Bay) Ontario in 1903, one of the first stations in Canada



American DeForest Wireless Telegraph Co. radiotelegraph station on the campus of Colorado College, Colorado Springs, CO, June 29, 1905 to Sept. 17, 1907. Call letters "CS". Installed by Charles B. Cooper and Elmo N. Pickerill. Operated and managed by Pickerill. Transmitter: a 2 K.W. open-core transformer, 18-jar Leyden condenser, a spark gap, and a change-over switch. Receiver: electrolytic detector, a three-coil tuner with five slides, and a pair of headphones. The mast is 160 feet high. One of a chain of ten inter-city wireless telegraph stations,---Denver, Boulder, Fort Collins, Cripple Creek, Altman, Pueblo, Trinidad, Leadville, Colorado Springs, Col., and Cheyenne, Wyo.

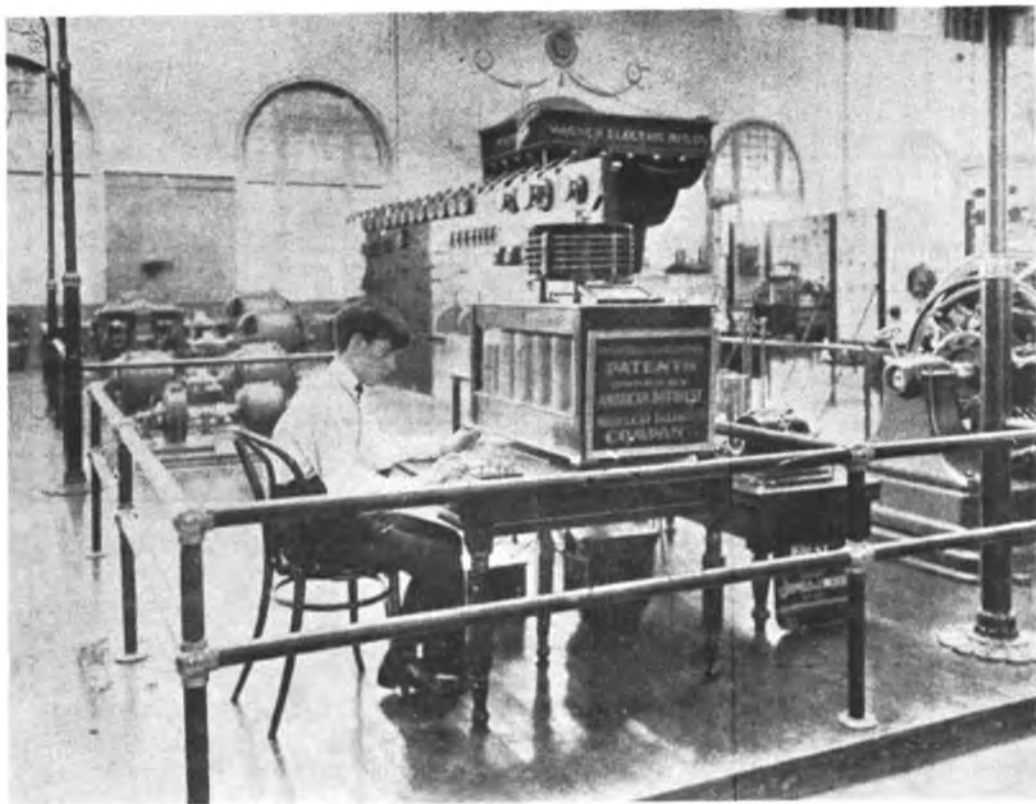
The original print was a small faded one furnished by E. N. Pickerill and photo-copied in 1953 by Kenneth Richardson. From the collection of Elmer H. Burgman, 487-P, Society of Wireless Pioneers.



Interior view of the American DeForest Wireless Telegraph station "CS" on the campus of Colorado College, Colorado Springs, CO, June 1905. E. N. Pickerill operator and station manager, later to become secretary of the DeForest Pioneers, Inc., in 1953.

See the photograph of the exterior view of the station, typical of a number of stations erected in this region; 2KW straight spark gap, helix, 133 cycles; electrolytic responder, five-slide tuner, headphones, etc.

Some Pictures of American DeForest Wireless Telegraph Company Stations



Portion of DeForest Wireless Exhibit at World's Fair, St. Louis



Wireless Telephone station of Dr. Lee deForest, San Francisco, Ca., 1910. The station was in the Phelan Building on Market Street.

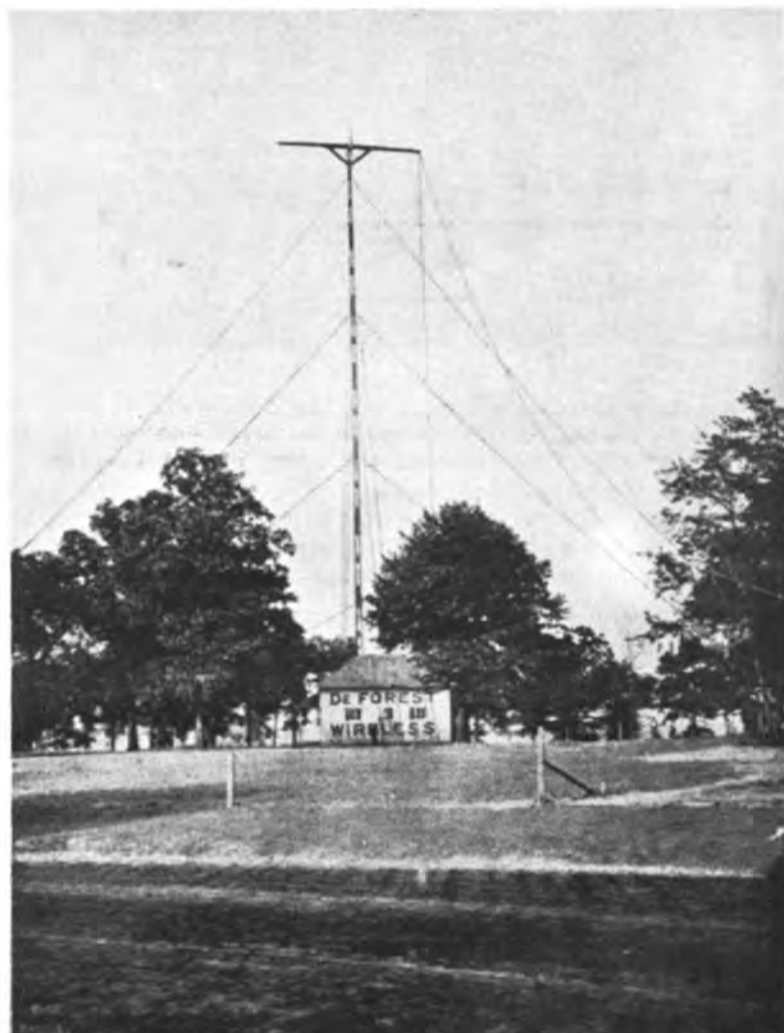
THE LOUISIANA PURCHASE EXPOSITION

The grand Prize and all other wireless prizes were awarded to the DeForest Company. No other system received an honorable mention.

DeForest apparatus was exhibited at the St. Louis Exposition by both the Signal Corps of the United States Army and the Patent Office. The latter issued for distribution a pamphlet setting forth eight notable inventions and described the DeForest System of wireless telegraphy to the exclusion of any other.

The several DeForest stations at the Exposition were in constant operation during the entire season. In addition to the exhibition given for visitors, the company conducted a public commercial business and supplied press news.

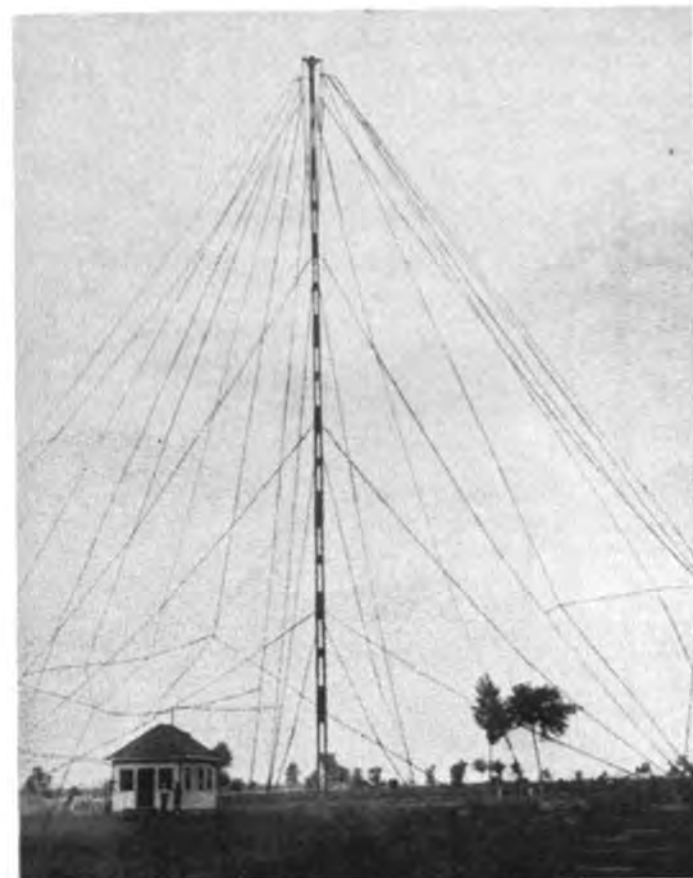
The DeForest exhibits were by far the most attractive feature of the Exposition and were of such great interest that President Roosevelt, during his visit to the Fair, spent a longer period investigating the DeForest exhibits than at any other single exhibit, and called it, "magnificent magnificent."



20 K. W. Station on Art Hill, St. Louis World's Fair, 1904



Picture of exhibit of the American DeForest Wireless Telegraph Co., at St. Louis Exposition and World's Fair [1904] which served as a 'Show-case' for the company's service and equipment. Standing back of Lee deForest (at key) is promoter Abraham White, alias Abraham Schwartz, who became President of the company. He, along with a stock dealer named Col. Christopher Columbus Wilson sold the 'magic of wireless' as the coming service which would replace land wire service. These 'con-men' soon 'milked' the American DeForest Wireless Telegraph Company and used part of the funds to finance a new undertaking they named the United Wireless Telegraph Company which was to flourish several years until patent infringements done them in.. A number of these promoters were later given jail sentences, however Lee deForest was exonerated and his name cleared of participating in these nefarious stock manipulations.



DeForest Wireless Station, Minnequa Park, Pueblo, Colo.



Dr. Lee deForest at Boulder, Colorado, May 1905. Picture snapped by Elmil N. Pickerill, station operator. This was near the American DeForest Wireless Telegraph office which can be seen in another photograph of this historic series. The original photo was small and faded and was loaned to Kenneth Richardson in 1953 to make copies. Picture furnished by Richardson was from the collection of Elmer H. Burgman, SOWP Member 487-P.

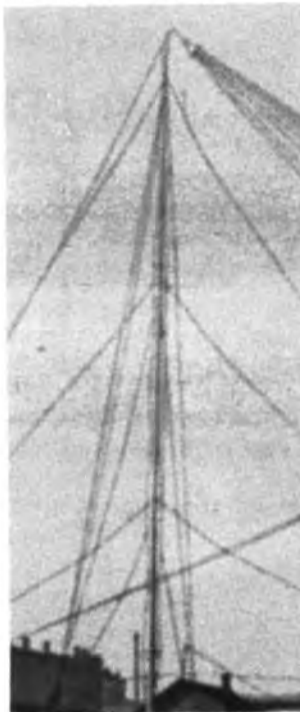
It will be observed that 'gentlemen' wore 'derby hats in those days.

Historical Photographs



E. N. Pickerill (left) and Charlie B. Cooper in front of the office of the American DeForest Wireless Telegraph Co. in the building of the Boulder National Bank, at Boulder, Colorado, DeForest stations.

The original photo was snapped by Pickerill's camera, was small and faded, and was loaned by Pickerill and photo-copied in May, 1953 by Kenneth Richardson. From collection of Elmer H. Burgman, SOWP MMBFR 487-P.



DeForest Wireless Station Fort Collins

Denver, Cripple Creek, Trinidad, Leadville, Greeley

It is a matter of some regret that we cannot show pictures of the stations at these points. The large 50 kilowatt station at Denver will be completed by January 1st. It was impossible to present a picture of the Cripple Creek station, owing to its peculiar position on the top of the National Hotel Building. The stations at the other points are in course of construction.

ODE TO LEE de FOREST (With apologies to Rudyard Kipling) By Robert A. Hug On the 50th Anniversary of the Audior

If every grid were grounded
And every cathode cold;
If every tube were broken
And no more tubes were sold;
This new world as we know it
Would come to a standstill;
Most modern great inventions
Would all be void and nil.

Our airplanes would be hampered,
Communications, too,
Would be completely thwarted
If such a state were true;
The programs that folks count on,
Of Radio and TV,
Would be forever silent
And no more shows we'd see.

Computers would not function,
And Radar's use as well
Would cease to be protective
'Gainst sneak attackers' hell;
If tubes like this were absent
That give such help and fun
We all would, soon encounter
A desolate world, my son.

Where the deForest Audion was born. The shed of the old Federal Telegraph Company's factory in Palo Alto, the cradle of the electronic age, was the laboratory of Dr. Lee deForest. The house adjacent to the "factory" still stands.

LIST OF DE FOREST WIRELESS STATIONS

THE following list of stations with the kilowatt capacity of each covers the DeForest Wireless Telegraph installations at present in operation in the United States, also in Canada, Central America, Cuba and Brazil. It foots up to the astonishing total of 492 1-2 kilowatts of total amount of energy which is being used by the DeForest installations in this hemisphere.

The list of High Power Distributing stations shows a total of 384 kilowatts. There will doubtless be stations installed in every town in the United States of sufficient size to justify the installation by the end of 1906 which will give between one and two thousand electric energy which will constantly be radiating out in the form of areograms from the various DeForest stations. To measure the growth of the wireless art in kilowatts furnishes a very graphic presentation of the rapid strides with which this new art has and will be developed.

Portland	2	Montreal	15	Buffalo	5	England—		Standard Oil Co....	City of Everett
Boston	20	Porto Rico	35	Bocas del Tora, United Fruit Co. 2		6-1/2	3 Eng.	Standard Oil Co.....	Astral
Providence	2	Guantanamo	35	Port Limon, United Fruit Co.... 2		2-2	4 Eng.	Standard Oil Co.....	Barge 95
Springfield	5	Colon	35	Rio de Janeiro, Grimle & Co.... 2		3-15	45 Ind.	Standard Oil Co.....	Barge 94
Hartford	2	Mobile	2	Santos	2	Total	384 K. W.	Standard Oil Co.....	Barge 92*
New Haven	2	New Orleans	2	Nome	2			B. & O. R. R. Co....	Tug "Savaga"
Bridgeport	2	New Orleans	35	St. Michaelis	2			Maine S. S. Co.....	Horatio Hall
New York	2	Southwest Pass	2	Ships, 1 each	25			Maine S. S. Co.....	North Star
Manhattan Beach	40	Galveston	2					Peninsula & Occidental S. S.	
Paterson	1	Port Bolivar	1/2					Co.	Mascotte
Galliee	2	San Francisco	2					Peninsula & Occidental S. S.	
Philadelphia	2	Cheyenne	2					Co.	Olivette
Atlantic City	2	Boulder	2					Panama R. R. Co.....	Havana
Washington	3	Denver	2					Panama R. R. Co.....	Mexico
Cape Hatteras	5	Colorado Springs	2					Panama R. R. Co.....	Allianca
Charleston	2	Cripple Creek	5					Southern Pacific S. S. Co.....	
Savannah	2	Pueblo	5					Prince Arthur*
Jacksonville	2	Trinidad	5					Munson S. S. Line..	Prince George*
Key West	2	Kansas City	15					Royal Mail Steam Packet...	Tagus*
Key West (Navy).....	35	Kansas City	20					Royal Mail Steam Packet..	Atrator
Pensacola	5	St. Louis	20					Royal Mail Steam Packet..	La Plata*
Cleveland	5	Chicago	2					Royal Mail Steam Packet..	Trent*
Havana	2	Chicago	20					Royal Mail Steam Packet..	Orinoco*
Ottawa	15	Indiana Harbor	2						*Under construction.
Quebec	15	Port Huron	1						

HIGH POWER STATIONS NOW LOCATED AND IN COURSE OF ERECTION

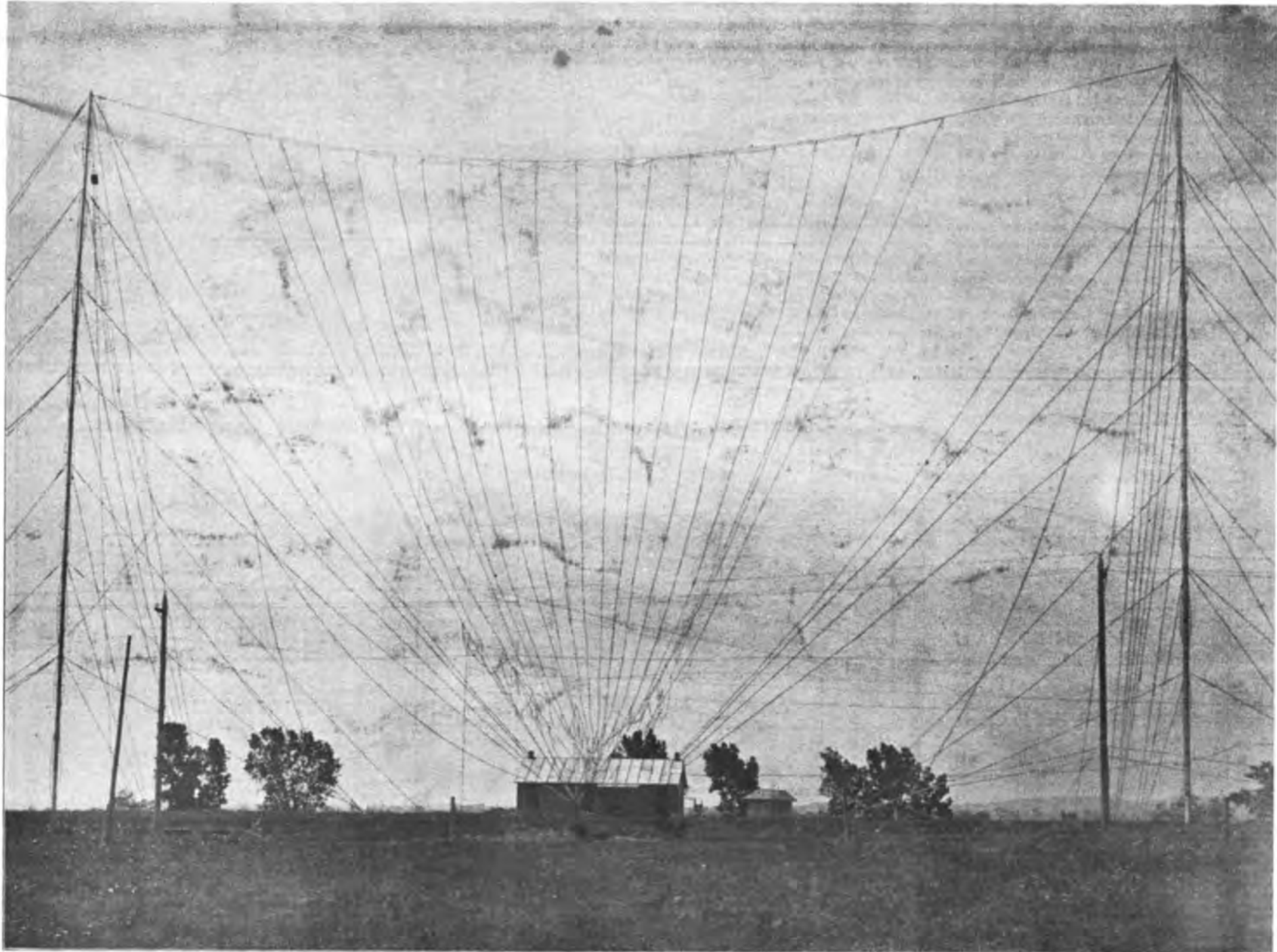
Toronto	25
Dom. Govt.	32
Atlanta	40
Denver	50
San Francisco	80
Sault Ste. Marie	15
Port Arthur	15
St. Johns, Nfd.	50
Ships	25

STEAMERS EQUIPPED WITH DE FOREST SYSTEM

Mallory Line	Denver
Mallory Line	San Jacinto
Mallory Line	Concho
Quebec S. S. Co.....	Bermudian
N. Y. & Porto Rico S. S.....	Coamo
N. Y. & Porto Rico S. S.....	Ponce
Red D Line	Philadelphia
Red D Line	Caracas
Ocean S. S. Co.....	City of Atlanta
Ocean S. S. Co....	City of Columbus
Standard Oil Co....	Capt. A. F. Lucas
Standard Oil Co....	Col. E. L. Drake
Standard Oil Co.....	Maverick

Standard Oil Co.....	City of Everett
Standard Oil Co.....	Astral
Standard Oil Co.....	Barge 95
Standard Oil Co.....	Barge 94
Standard Oil Co.....	Barge 92*
B. & O. R. R. Co....	Tug "Savaga"
Maine S. S. Co.....	Horatio Hall
Maine S. S. Co.....	North Star
Peninsula & Occidental S. S.	
Co.	Mascotte
Peninsula & Occidental S. S.	
Co.	Olivette
Panama R. R. Co.....	Havana
Panama R. R. Co.....	Mexico
Panama R. R. Co.....	Allianca
Southern Pacific S. S. Co.....	
.....	Prince Arthur*
Munson S. S. Line..	Prince George*
Royal Mail Steam Packet...	Tagus*
Royal Mail Steam Packet..	Atrator
Royal Mail Steam Packet..	La Plata*
Royal Mail Steam Packet..	Trent*
Royal Mail Steam Packet..	Orinoco*

J. B. STOTT & CO., PRINTERS, DENVER



The 50 Kilowatt Station at DeForest, Colorado, Six Miles West of Denver.

A SLOW-MOVING river—a broad field of green—white tents—the sound of soldiers marching—bands playing—lowering of colors—and my first day in the "Yale" Battery of the Spanish-American War found me alone in the hour of camp hilarity.

My attention was soon attracted by a young soldier, alone too, deep in study, in the tent next to mine. He was a dark, rather tall angular-looking lad.

"Studying regulations?" I asked.

"No, just a little of the old college work," he said, without looking up.

But that same night, as we were walking along the Niantic River, this soldier-student said to me:

"This little book you've found me reading means a good deal to me, in fact, the subject it deals with will mean everything to me after we've defeated the Spaniards. I feel it may also prove some time of great importance to humanity—I've felt that way ever since I entered college. When my father died, a few years ago, and I was thrown upon my own resources, I decided to continue my studies by working my way through college. I mowed lawns, waited on the table and worked in summer hotels. I graduated from the Sheffield Scientific School in '96, and ever since I've been preparing for a doctor's degree. It is my thesis you saw me working on just a few hours ago—the subject is 'The Reflection of Hertzian waves along Parallel Wires.' Hertzian waves!—that means a whole world to me!—a new world of communication—without wires—wireless! There's no other enterprise like it to-day in fascination and in future possibilities."



Marconi was yet to pave the way for public interest in wireless by his early demonstrations, but even then my soldier friend, Lee De Forest, saw what was to come. The universal development of radio on a practical basis—his life-long dream!

Among the busy duties of camp life, I soon lost track of my enthusiastic companion and forgot the idealistic vision of the future which he had on that one evening revealed to me.

Shortly after the war was over, De Forest obtained his doctor's degree and went to work in Chicago. His first job was at the Clinton Street shop of the Western Electric Company, at \$8 a week. Teaching night classes in mathematics at the Lewis Institute and translating French at one time or another for the *Western Electrician* also helped. For a year and a half, the young inventor lived on next to nothing, so that he could conduct his research freely at the Armour Institute.

It was in the midst of these early-day struggles and privations that De Forest developed the self-restoring detector to take the place of the Marconi coherer, the telephone receiver to replace the relay and Morse inker and the alternator-generator and transformer to replace the induction coil and the interrupter.

In 1901, with his apparatus perfected to the

point where it could be used commercially, De Forest left for New York. Financial aid was necessary to float his company and develop his new American System, which, even then, had been proved superior to the older and well-established Marconi and Telefunken systems of Europe. Nevertheless, in the summer and fall of that year, De Forest walked his shoes out in Wall Street and Lower Broadway before he obtained the necessary backing.

His first commercial undertaking with the De Forest Wireless Telegraph Company, that same year, was the reporting of the International Yacht races. Then, during the historic tests by the British Post Office between Holyhead and Howth across the Irish Sea, De Forest demonstrated over all competitors the great advantages of his system. In 1904, he attained wider recognition for his system through the spectacular success of the *London Times* war correspondent, Col. Lionel James, in reporting the Naval maneuvers at Port Arthur during the Russo-Japanese War. In the summer of that same year, also, came the first continental overland wireless service, established by De Forest between Chicago and the Exposition in St. Louis. In 1905, the honor of constructing the first high-powered wireless stations at Colon, Guantánamo, San Juan (Porto Rico), Key West and Pensacola, was accorded him by the United States Government.

Success had come, but only for the moment, for the fortune and recognition, won after so many years of struggle and sacrifice, were soon swept away, and the young inventor saw his company in the hands of others, with even his name removed from the corporation which he had made famous.

It was after this period of financial depression that I met him again. De Forest had made a crude laboratory in the old Parker Building in New York City. As he was explaining his laboratory to me, he picked up an audion bulb.

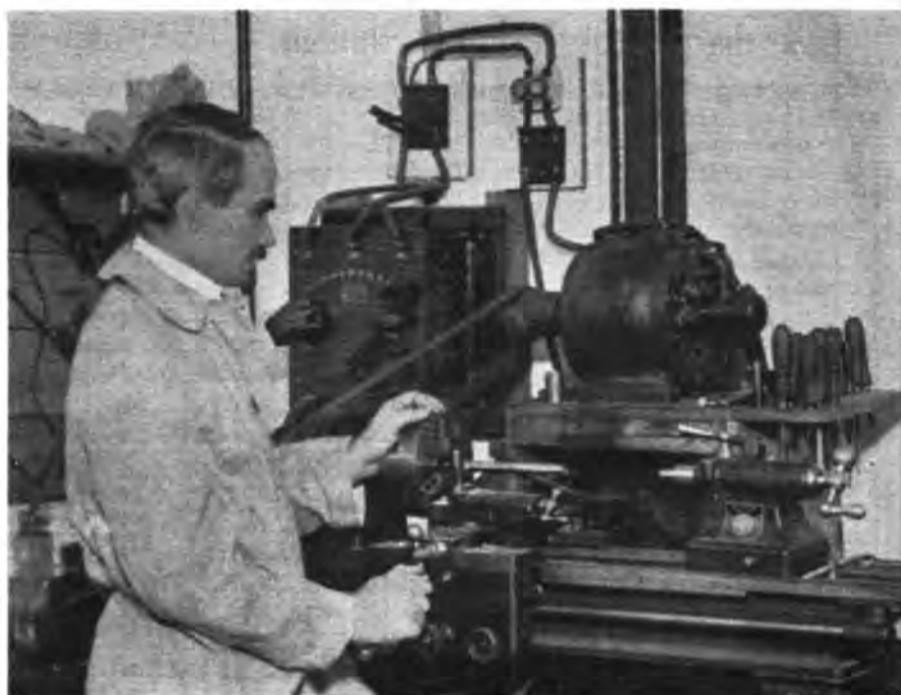
"This is my greatest discovery!" he said. "This little bulb is going to revolutionize the world of communication! It will make it possible for us to talk by radio telephone, not only over short distances, but across the lands and seas. I took out my first patents on this audion a little over a year ago, but it was in the hard days in Chicago that I first conceived the idea.

"I was at work in my room, one night, ex-

DE FOREST—THE DREAMER OF A DREAM THAT CAME TRUE

By C. S. THOMPSON

Reprinted from "RADIO BROADCAST" published Dec. 1922 [62 years ago]. This copy courtesy The Horn Speaker, published by Jim Cranshaw N5FSL, PO Box 53012, Dallas, Tx. 75253-0012. (The 'Horn Speaker' specializes in antique broadcast receivers & components)



Dr. Lee De Forest, in his private laboratory, Terminal Building, New York City



DR. LEE DeFOREST AND HIS WIRELESS TELEPHONE



--- THE FIRST SET ---

The first deForest audion, with its third element, or grid, plainly in view.

The cabinet contained the "B" battery, a voltage selector switch, an on-off "A" Battery switch, and a rheostat for regulating the filament volage.

Early demand far outstripped supply. The outfit sold for \$18.50 less batteries.

Historical Review

perimenting with an electrolytic detector for wireless signals. It was my good luck to be working by the light of a Welsbach burner. That light dimmed and brightened again as my little spark transmitter was operated. The elation over this startling discovery outlasted my disappointment when I proved that the startling effect was merely acoustic and not electric. The illusion had served its purpose. I had become convinced that in gases enveloping an incandescent electrode resided latent forces which could be utilized in a detector of Hertzian oscillations far more delicate and sensitive than any known form of detecting device. And now at last I have managed to bottle this same gas effect!"

As he went on, he became even more enthusiastic:

"I've been asked to put radio telephones on the fleet going around the world. It won't be long then before all the ships will be equipped with it. It'll be on the yachts, tug-boats, steamers and sailing vessels too, and we'll soon be able to talk with our friends at sea. Passengers on moving trains will be able to radiophone to stations, and there be connected with the wire telephone. Church sermons, lectures, orchestral and grand opera music, too, will be sent out by radio throughout the country! The world needs this little audion; it is the one thing towards which I have been working all these years!"

In the spring and summer of 1907, through the transmission of music by radiophone,

DE FOREST—THE DREAMER

through reporting yacht races on the Great Lakes, and later by broadcasting grand opera from the Metropolitan Opera House at New York, De Forest sought to create interest in the new art.



DR. DE FOREST
Experimented with bulb transmitters for airplane use, during the war, when patriotic service suspended his efforts in the field of broadcasting

Even thus early, foreseeing the field of public interest, he built radio apparatus for the amateur—for the citizen who was interested in picking up words and music out of the air. With his second De Forest Radio company, all his available funds and ingenuity were thrown into the cause of broadcasting.

It is clear that the public of that day was fully informed by De Forest of the possibilities of radio development. Newspapers were filled with his predictions. Reporters obtained from him long interviews. The Sunday pages were highly decorated with the stories of his achievements. Nevertheless, his appeals fell on empty ears. "The radio toy," some described it. Others read and forgot. Leaders in engineering, scientific, and educational circles were skeptical as to

the possibilities of broadcasting.

In the end, borne down by commercial rivalry, the Radio Telephone Company through which the inventor had hoped to interest the public, and to establish the radio telephone, was forced to suspend activity.

All that remained for him in the wreckage was the patent rights to the audion. Even these had been returned to him because they were considered of no value!

There was nothing left apparently, in 1911—the year when I next chanced to meet him—nothing except the spirit of other days.

"I've got to begin all over again," he told me: "and that means—just a little more delay. That's all. The day is coming, when things will be different. I don't mean financially. I can stand the poverty and work—I mean the day will soon be here when people will see the thing as I see it—will recognize the part the audion will play in human progress!"

Nevertheless, that same year, De Forest was reading the Help Wanted ads in the very papers which, only a few years before, had been carrying pages relating his achievements. The position of Research Engineer of the Federal Telegraph Company was offered him in San Francisco, and he was glad to take it—finding joy in the thought of being able to experiment further on his audion. In the summer of 1912, in that little Palo Alto laboratory, he was led to still higher dreams of success. The audion had already proved to be a detector of remarkable sensitiveness as well as an amplifier of telephone currents; he then discovered it could also be made to oscillate, or to generate sustained currents of any frequency!

The engineers of the period were fully informed by De Forest on the possibilities of the audion. The newspapers and technical magazines were filled with it. Full descriptions of it were to be found in the patent office applications of 1906. De Forest took out his first patents applications on the audion as a wire telephone amplifier as early as 1907. But it was not until 1912 that the inventor was given his first opportunity to demonstrate the audion before the engineers of the American Telephone and Telegraph Company—the audion which, when further developed by them, made possible the transcontinental telephone service between New York and San Francisco, and later on the radio conversation from Arlington to Honolulu.

With the funds thus secured, the inventor established his De Forest Radio Telephone and Telegraph Company, and thereby sought to realize his first dream of radio broadcasting. In 1916, many an amateur heard his nightly concerts, news bulletins, and election returns by radio from the Highbridge laboratories. The press told of this and of dancing to radio music, and from these reports emanated the idea of the educational as well as the entertainment value of radio. But though the inventor appealed to many, there was still no one to take the first step in this commercial or public enterprise.

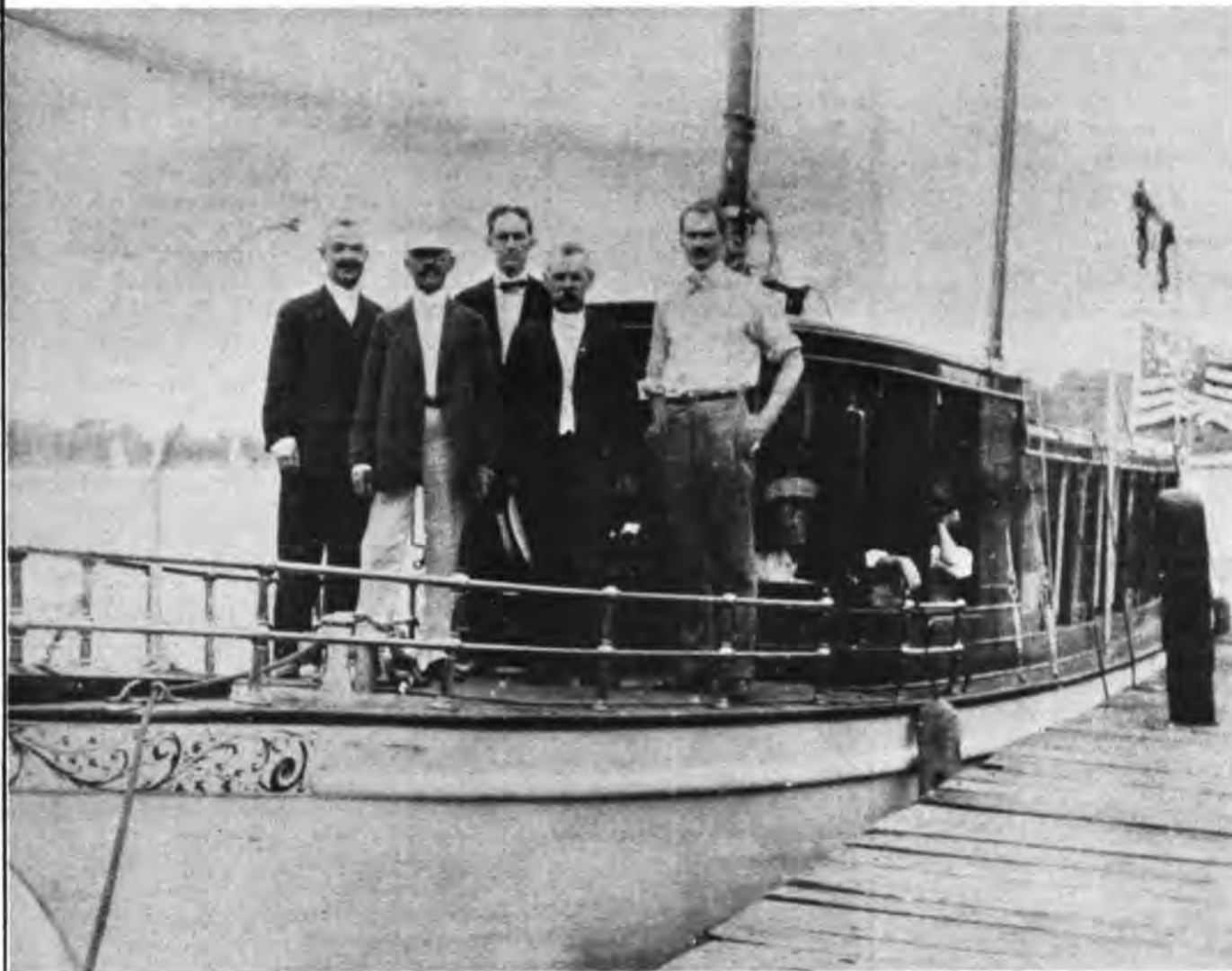
Even government officials, who were in a position to help the broadcasting of news and music, vetoed this "pastime" on the score that it interfered with the Navy's wireless telegraph.

The new era of radio which De Forest had predicted as far back as 1907, which he had so plainly demonstrated, appeared to be fading away!

Patriotic service during the World War interrupted his efforts towards broadcasting. Immediately afterward, De Forest made a desperate appeal to the publishers of the various newspapers of the country for recognition of the many possibilities of radio transmission. Only one responded, and the first newspaper radio service in the world was established in 1920 by the *Detroit News*.

With New York still blind to radio, De Forest went to San Francisco, where he started the broadcasting of orchestral music from the California Theatre. Shortly afterward, the directors of the Westinghouse Company opened their permanent stations at Pittsburgh and Newark. But the public interest was yet to be aroused!

De Forest sailed for Germany in November, 1921 to experiment on still another use of the audion—the production of talking motion-picture films. At about this time came the radio awakening in America, and some six months later, the inventor stepped ashore in New York from a European steamer. His hair was tinged with gray, but in his eyes shone a new light, as he turned to me and said: "My dream of radio is finally coming true!"



The Yacht "Thelma" owned by Commodore W.R. Huntington of Put-in-Bay, Ohio on Lake Erie was probably the first boat to be equipped with wireless telephone. It used Dr. Lee deForest's system employing the arc as generator of sustained oscillations, modulated by the carbon microphone. Used for reporting the regatta of the Interlakes Ass'n. in July 1907. Installed by Dr. deForest assisted by Frank Butler. Communication maintained with shore station erected by deForest up to 4 miles. The successful use of wireless created much comment throughout the scientific press of the day. In above picture, Dr. deForest is on right in shirt sleeves. Picture from collection of Kenneth Richardson and was furnished by Elmer Burgman.



SPARKS ACROSS THE PACIFIC

BY

CAPTAIN ALMON A. GRAY USNR - RET.

SOWP -810-P

SPARKS ACROSS THE PACIFIC is an account of Pan American Airway's communication system in the Pacific Ocean area during the 'flying boat era' 1935 - 1942. It was written by Captain Almon A. Gray, Ass't. Communication Superintendent of Pan Am's West Coast [Alameda] Division. "Al's" letter is quoted below.

RFD Rt. 1, 117
Brooksville, ME 04617
Nov. 10, 1983

William A. Breniman
Society of Wireless Pioneers
P.O. Box 530
Santa Rosa, CA 95402

Dear Bill,

I have enjoyed the aviation issues of Sparks Journal greatly. They are indeed pages of history! I was disappointed though, not to find something about PAA pre-war communications in the Pacific. I got to wondering why there was nothing and the melancholy realization came to me that probably I am the only one still living who was with the company throughout the entire flying boat era and who occupied a position that would permit him to write about the communications on a system basis. (I was the Assistant Communications Superintendent). It seems a shame to let that period go unrecorded, so I have put together an account of it. It is enclosed. I tried to be brief but I estimate there still will be material to fill five or six pages. I hope you can use it, but if you cannot, it still will be in the files for reference.

Sincerely
(S) AL. GRAY - 810-P

FOREWORD

Early flights across the Pacific were the 1935 counterparts of the manned orbital space missions of the 1960s. They caught the attention of the public and vast amounts of newspaper and magazine space was devoted to them. Also, in the past several years a number of good books have been published covering the Pacific operations in broad terms. But nowhere, neither in the early material nor in the more recent publications, have I seen a comprehensive, semi-technical write-up about the communications system which supported the Pacific activity. Without such a system transPacific flying on a scheduled basis would have been impossible; therefore I believe that posterity is entitled to know something about it. That which follows is my attempt to provide that information. It covers the period from March 1935, when I left the Navy to join PAA's newly formed Pacific Division, until I left the company in early 1942 to go back to the Navy and WW II. I have had access to no records, hence what has been written is based entirely on memory. 1935 was a long time ago and my mental images of people, places and events are not as sharp as they were once. It may be, therefore, that I have failed to mention some things that should have been noted; and I may be wrong on some minor details. On the whole, though, I believe that what follows is an accurate and fair portrayal of what took place. I sincerely hope it will serve a useful purpose.

INTRODUCTION

In the Fall of 1934 the management of Pan American Airways decided to initiate air service between San Francisco and the Orient. It would operate flying boats via Honolulu, Midway Island, Wake Island, Guam and Manila. Radio communications were vital to such an operation, and as no adequate facilities existed in the area, PAA commenced construction of its own network of air/ground and point-to-point radio stations along the proposed route. George W. Angus (sine US), an ex-Marine Corps operator who had been in charge of PAA communications in Peru, was transferred to the States to oversee this effort.

Ground Radio Stations

GROUND RADIO STATIONS The operating base in the San Francisco area was at the old Curtis-Wright airport in Alameda. The first of the radio stations to become operational was KNBD, which went on the air around mid March 1935. It was located on the edge of the airport, abutting on the waters of San Francisco Bay. Herman O. Gentry was transferred up from Miami to be chief at KNBD. In 1938 the Navy took over the Curtis-Wright field and the adjoining Benton Army Air Field as the site for the Alameda Naval Air Station. At that time the flying boat operating base was moved to Treasure Island, in San Francisco Bay, and KNBD was moved out into the country to Eden, a few miles east of San Leandro, Calif.

The second station to come on line was KNBF. It was located at Mokapu Point, on the east coast of Oahu, T.H., where the Kaneohe Bay Marine Corps Air Station now is located. Joe Eichel was the chief there. Some of the early operators were Leroy "Swede" Paulson, Jim Light, "Lan" Charman, and "Lem" Hobdy. This station became operational around the first of April 1935. Around 1938-39 it became necessary to move the station to make way for the Marine Corps facility so it was relocated to Pearl City.

In the meantime materials and personnel to construct and man operating bases and radio stations at Midway, Wake, Guam and Manila were put aboard the chartered steamship "North Haven" (KUDZ) and gotten underweigh. Construction of buildings, erection of poles, laying of cables, etc. was done by the construction crews but the actual installation of the radio equipment was done by the radio operators who would run the stations. James J. Cushman, who had spent several years installing and maintaining PAA radio stations in Mexico and Central America, supervised the conventional radio work. Everard H. Stuhrman, an eager young radio engineer from the New York office, was in charge of work on the much publicized long-range radio direction finders.

(Continued on Page 17)



Martin M-130 China Clipper" [NC-14716] flying outbound over unfinished Golden Gate Bridge. Taken Nov. 22 1935. Almon A. Gray photo.

KNBH at Midway went on the air around April 27, 1935, with K.C. "Casey" Ambler in charge. Am uncertain about the other operator but believe it was Jack Smyser.

KNBI, Wake, went on the air from a temporary site on Wilkes island on May 12, and from its permanent site on Peale island on June 22, 1935. Almon A. Gray (810-P) and William J. "Bill" Breuer were the two operators there.



PAN AMERICAN AIRWAYS

The Radio Gang at "KNBF" [Mokapu Point, Oahu, T.H.] Feb. 13 1936
L/R: "Lan Charman(CH), "Swede" Paulson (PN), "Lan" Light (XL),
Joe Eichel (JL) Chief and Harry Macomber (Custodian). [Gray Photo]

KNBG, Guam, started up at a temporary site on June 6th and was operational at the permanent site in Sumay by August 1, 1935. Larry Monett and Arthur B. Nolan (372-P) were there.

The station for the Philippines was KZBQ located near Fort McKinley, on the outskirts of Manila. After finishing his construction/installation chore, Jimmy Cushman remained there as chief. The operators were Filipinos. One was Roberto SantaMaria (RO). Another was Eduardo Fernandez (EF). Both had spent many years with the local Bureau of Posts and Telegraphs and were excellent operators.

All six of these "main line" stations were very similar. Each had three separate sites; one for transmitters, one for receivers, and one for radio direction finding. These sites were several hundred yards from each other to minimize the mutual interference.

The buildings, with the exception of those at Alameda and the receiving building at Manila, were of prefabricated plywood construction. As I recall, they were called "Dally" buildings. The plywood roofs were covered with chemically treated canvas to facilitate collection of rain water. (There was no source of fresh water on Wake other than rain.)

All radio communication was via manual CW telegraphy. Frequencies used on the "main line" were 1638, 2986, 5165, 8220, 12330, and 16440 Khz. These were authorized for both air/ground and point-to-point usage. In addition KNBH, Midway, and KNBI, Wake, had special authorization to use 500 Khz. for communication with surface vessels.

Transmitter Sites

The main transmitter used was the Western Electric model 14-A which had been modified for CW operation. It was a crystal-controlled, ten-channel, remotely controlled unit utilizing a large air-cooled PA tube and having an output of about 450 watts on the lower frequencies ---much less above 8 Mhz. One could turn the transmitter on and off, change frequencies, and key it from either the receiver or the RDF site. All main line stations had at least one of these transmitters. Alameda had two, and I am quite sure that Mokapu also had two.

The secondary transmitter was the PAA model 100-G-2. This was a MOPA unit having an output of around 100 watts. By utilizing pre-tuned plug-in coils this transmitter could operate on any of the authorized frequencies. Two frequencies could be set up at a time and be remotely selected and controlled from either the receiving or RDF site. This model had been designed for use in a tropical environment and was extremely rugged and trouble-free. Each station had one of them.

The transmitting antennae were half-wave doublets with the exception of the one used for 1638 Khz. Some of those were Marconi and others had a matching box and were treated like random length wires. These

antennae were of phosphor-bronze wire supported by four 45 foot wooden poles arranged in the shape of a square, with the transmitting building in the middle. In most cases the antennae were center feed with open wire twin feeders. At Wake, however, it was found that for some reason a single wire, off-center feed of the "Windom" type worked better. That was used on all the higher frequencies.

At each station there was an alternative source of power capable of running all of the radio gear in event of failure of power from the mains. In addition, each 100-G-2 transmitter had its own emergency generator driven by a small Briggs & Stratton gasoline engine.

Receiving Sites

RECEIVING SITE The receiving station was a relatively simple and austere facility. The operating position was basically an oak office table on which the receivers sat and on which the transmitter controls, telegraph keys, message racks etc, were mounted. A separate small stand on large casters supported a Western Union type "mill". Next to that were the teleprinter machines (not used at Midway or Wake). The operator on watch sat in an office type swivel chair, also having large casters, which enabled him to move quickly from one place to another. All reception was via headphones, usually having extra-long cords. There were no loudspeakers, but there was a device which permitted feeding the output of several receivers to the same set of phones.

The radio receivers used at all stations were designed and manufactured by PAA specifically to provide trouble-free performance in a tropical environment. As I recall, the unit had a tuned input, a stage of RF amplification, a regenerative detector and one or two stages of resistance coupled AF amplification. It made use of plug-in coils and covered the spectrum from about 500 Khz. to about 25 Mhz. Heater voltage came from lead-acid batteries which were kept on trickle charge. Plate voltage was supplied by dry-cell "B" batteries. Each station had at least two of these receivers; most had more.

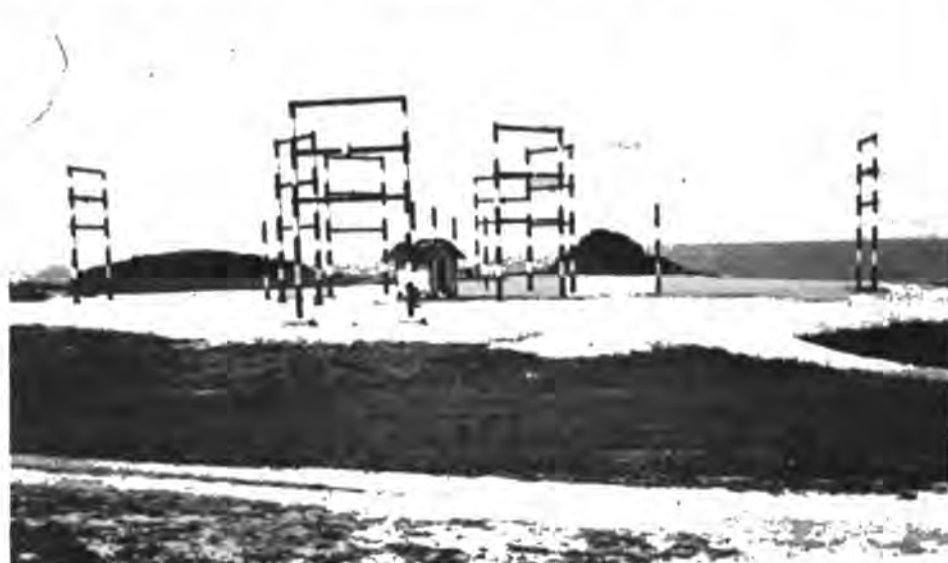
The receiving antennae were half-wave doublets supported by four 35 foot wooden poles in a square configuration similar to the transmitter arrangement. Lean-ins were of heavy duty twisted pair coming from the center of the doublet.

MOBILE UNITS Midway and Wake each had a 38 foot twin-engine boat which served as utility and crash boat. These were radio equipped with aircraft type transmitters of about 15 watts output and aircraft type receivers. They utilized CW and operated on the same frequencies as the main station.

Radio Direction Finding Sites

RADIO DIRECTION FINDER SITE The radio direction finding facility was unique to PAA.

When the company commenced operations in the Caribbean area there were no radio aids to aerial navigation there; consequently the company had to provide at its own expense whatever aids it needed. It opted to utilize a radio direction finding system in which PAA RDFs on the ground took radio bearings on the aircraft and sent those bearings via CW to the aircraft. Manual, rotating loop RDFs were used. At first frequencies around 375 to 450 Khz. were used, but because of the low power of the aircraft transmitters the range was



PAA AIRWAYS - MOKAPU POINT, OAHU, T.H. - Feb. 13 1936
Adcock High-Frequency Radio Direction Finder Station.
Almon A. Gray Photo.



PAN AMERICAN AIRWAYS - STATION "KNBF" Mokapu Point, Oahu. Radio Operating Position. Jim Light (XL) on watch. Feb. 13 1936 From collection of Almon A. Gray.

extremely limited. After considerable experimentation it was found that with the limited power in the aircraft, the best radio bearings, over the greatest distance, could be obtained by using frequencies in the 1600 - 1750 Khz. part of the spectrum. Special loops were developed and manufactured for use on these frequencies and it became possible to obtain acceptable bearings over ranges of several hundred miles. This was adequate for the relatively short hops in the Latin American area. However, as larger aircraft became available and longer hops to South America were contemplated, it became obvious that the distance over which bearings could be taken would have to be increased considerably. There were two options for accomplishing that; increase the power of the aircraft transmitter, or utilize frequencies having long-distance propagation characteristics. The aircraft simply could not accommodate the weight of transmitters that would be required to significantly alleviate the problem, therefore efforts were directed toward the use of high frequencies for RDF work. Hugo C. Leuteritz, the Chief Communications Engineer of the company, examined what was available throughout the world in the way of radio direction finding gear and concluded that the British "Adcock" system showed the greatest promise of being adaptable to use on high frequencies. He and his assistant, Frank W. Sullinger, commenced such an adaptation and after much experimentation came up with a version of the Adcock RDF they believed would do the required job. A unit was constructed at Miami and was tested extensively by aircraft on regular flights. The performance was deemed satisfactory and a go-ahead was given for fabrication of a sufficient number of units to support the trans-Atlantic operation which was contemplated for the near future. Leuteritz gave this job to Pan American Manufacturing and Supply Co. (PAMSCO), a PAA subsidiary headed up by Frank Sullinger, and work on the units began immediately. Then plans were changed. A political glitch prevented PAA from starting the trans-Atlantic service, and as the length of the delay was indefinite, it was decided in mid 1934 to start a trans-Pacific service instead. Accordingly the number of Adcocks to be manufactured was increased and six systems were shipped to San Francisco for the PAA Pacific Division then being formed. During 1935 they were installed at Alameda, CA; Mokapu Point, Oahu; Midway; Wake; Guam and Manila, P.I.

The writer is not an engineer, therefore the following description of the PAA high frequency radio direction finder is written from the viewpoint of an operator and user.

The Basic Adcock System

The basic Adcock consisted of four vertical dipoles, made of about one inch diameter brass tubes, equally spaced along the arc of a circle, and well above ground. There was a tuning/impedance matching box at the mid-point of each dipole, and each dipole was connected through this box to the dipole on the arc 180 degrees away by a two-wire cable transmission line that looked like overgrown twisted pair cable. A feeder of the same type cable came off at the mid point of each of the two transmission lines and ran to a goniometer in the operating shack which was located at the center of the circle. The output of the goniometer fed into the front end of a PAA designed and built receiver. This receiver was essentially the same as those on the communication circuits but had the front end redesigned to match up better with the impedance of the goniometer.

The Complete RDF System

The complete RDF system consisted of two of the basic Adcocks with the antenna arrays located on the arcs of two concentric circles. The dipoles of the outer Adcock were offset 45 degrees of arc from the dipoles of the inner Adcock. The diameter of the circles had a relationship to the frequency on which the unit would be used. The outer system had a diameter of around 500 feet and was peaked on 1638 Khz. It was used on frequencies between about 400 and 3000 Khz. The inner system had a much smaller diameter, probably around 100 feet. It was peaked on 5165 Khz. and covered from about 3000 to 8500 Khz.

The arrangement of the dipoles is shown in Fig. 1 below. Fig. 2 shows how the dipoles were supported. Picture 1 shows the overall antenna system. Picture 2 shows the receivers and goniometers.

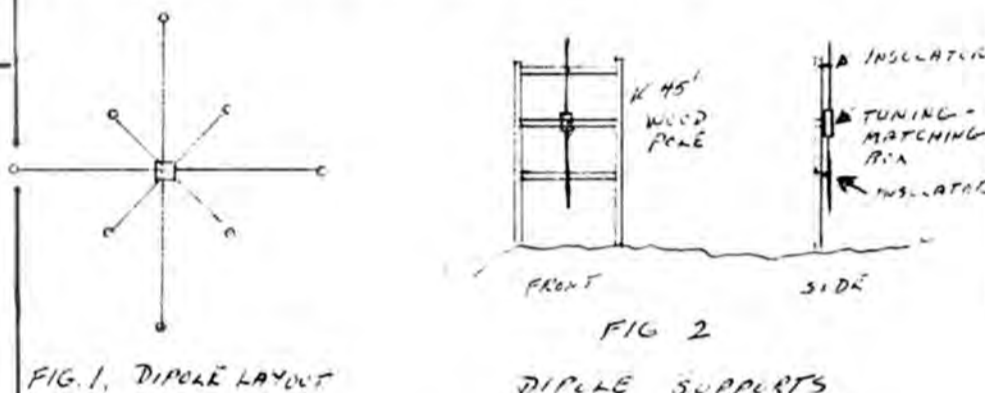


FIG. 1, DIPOLE LAYOUT

FIG. 2
DIPOLE SUPPORTS



Operating Position, Pan American Airways Station "KNBI" WAKE ISLAND - 1935. Adcock Radio Direction Finder pictured on front of operations desk. Almon A. Gray Photo.

With this system a bearing was obtained by rotating the goniometer dial until a minimum signal or "null" was obtained. The system was bi-directional hence one had to be ever mindful of the possibility of reciprocal bearings. That was not much of a problem however as one usually knew the general location of the aircraft. The Adcock was much more effective on the lower frequencies than the rotating loops. It was not at all unusual to take good bearings on 1638 Khz. when the transmitting aircraft was 1000 - 1200 miles away. On 5165 Khz., where a rotating loop was useless, one at most times could get fair bearings at distances of 2000 miles or more. Generally speaking however, on frequencies above 2 Mhz. the null was less definite and tended to wander a bit. When using the inner Adcock it was the practice to take the average of at least five bearings to arrive at the bearing given the aircraft.

BEARINGS

This RDF had to be electrically balanced very precisely and the balance was very sensitive to outside influences. Any changes in its elements or nearby environment would upset the balance and affect the performance adversely. Weeds and brush had to be kept mowed in the area of the dipoles, otherwise the system would be thrown out of calibration. On one occasion at Alameda rain water seeped through a gasket and accumulated in one of the tuning/matching boxes without anyone being aware of it. The resulting error in bearings nearly caused the loss of a plane. Later, after the Alameda RDF was relocated out in the countryside at Eden, CA. we were driven nearly "nuts" because the calibration of the system would shift back

GRAY



PAA PIONEERS THE PACIFIC



Pan AM Radio Receiving Room & Operations office
WAKE ISLAND - Oct. 1935. [Almon A. Gray Photo

and forth between two different calibration curves at irregular intervals without any apparent cause. After weeks of searching it was found that the problem was caused by a farmer about a quarter mile away opening and closing a metal gate to his wire enclosed pasture. At Mokapu Point the insulators supporting the dipoles had to be hosed down with fresh water every couple of days, otherwise salt from the nearby ocean would accumulate on them and create a leakage that made nulls to be wide and indefinite. At Midway the gooney birds would fly into the dipoles, bending them or knocking them out of alignment. This threw the system out of kilter. Nets had to be rigged around the dipoles to protect them. Once while I was handling an incoming flight at Manila the bearings I was taking suddenly went absolutely screwy. I went outside to see what might have happened and found a small herd of carabaos calmly grazing under one of the dipoles. Once they were driven off the bearings returned to normal. I mention these things to illustrate that while the PAA radio direction finding system was, without question, the best long range navigational air then available anywhere, and that without it Pacific operations probably would have been impossible; at the same time it was a temperamental beast that put many gray hairs on the heads of those who operated it and those who had to rely on its product.

USING THE RDF Bearings were taken and sent to the aircraft routinely at half hour intervals. If the aircraft desired them at other times they were requested by the signal "QTE?". If an RFD approach were being made, the aircraft would send long dashes almost continuously after it believed it was within fifty or so miles of the station. This was so that the DF operator could note the rapid change of bearing that would occur should the aircraft pass to either side of the station, and also note the build-up in signal strength which took place as the aircraft neared the station. The objective of course was to avoid having the plane pass over the station and keep going out on a reciprocal bearing. The lowest frequency that would provide adequate signals was always used for air/ground communications and RDF work. Normally a plane would depart on 1638 Khz. and stay there until signals began to get quite weak. At that time it would shift to 5165 Khz., which in many cases would hold up until signals on 1638 from the station of destination could be picked up. If signals on 5165 started to go out, a change would be made to 8220 Khz. which would almost always hold up until 5165 from the station of destination became readable. Regulations required an exchange of signals between plane and ground at intervals no greater than fifteen minutes, and it was very, very seldom that this was not done. There were a few times however when solar flares caused all except the lowest frequencies to drop completely out for periods from a couple of minutes up to an half hour. At those times there was little one could do other than sit there and sweat it out.

Aircraft Installations

The radio configurations of the three Martin M-130 aircraft (China, Philippine and Hawaii Clippers) were identical. The installations in the Boeing B-314 aircraft also were all alike. They were however, slightly different from the M-130s in that they had a different type transmitter and a better operating position. Basically the radio installation consisted of two CW transmitters, two receivers and a Bellini-Tossi type radio direction finder. All of the equipment was designed and manufactured by the PAA subsidiary, PAMSCO.

The transmitters in the M-130s were MOPA units using a triode similar to a 210 as the oscillator and two of the same type tubes in parallel in the PA. They put out around 50 watts. Use was made of plug-in coils pretuned to the authorized frequencies so no tuning in flight was required beyond tuning the antenna and peaking the PA. The units took filament power directly from the plane's 12 volt main power system. Plate power was derived from dynamotors driven from the 12 volt mains. Each transmitter had its own dynamotor. One transmitter was located away back in the tail section and could be used only with a hand-cranked trailing wire antenna. (At ten thousand feet, with no oxygen and wearing a heavy leather flying suit, it was quite a chore to climb down from the cabane, walk the length of the ship, get onto your hands and knees and crawl into the far-below-zero temperature of the uninsulated tail section to reel the antenna in or out - especially if the tail happened to be weaving back and forth and bucking up and down, as usually was the case!) The other transmitter was mounted in the cockpit area, directly behind the Flight Radio Officer's position. It utilized a fixed-wire antenna which ran from a mast about six feet tall mounted on the forward part of the wing center section, back to the vertical fin. In both cases the keying relay also transferred the antenna between transmitter and receiver.

Transmitters in the B-314s were of a newer and more powerful type. As I remember, they were designated as Model 75-AX-2. They had the same MOPA and plug-in coil arrangement, but the output was about 75 watts and provision was made for remotely selecting either of the two channels that could be set up in the transmitter at one time.

The receivers, also designed and built by PAMSCO, had a tuned stage of RF amplification, a regenerative detector and one (or possibly two) stages of resistance coupled AF amplification. Heater power came from the ship mains and plate power was from dry-cell "B" batteries. Plug-in coils provided coverage from around 300 Khz. to around 20 Mhz. The transmitters and receivers were very rugged. Jacks, plugs, switch contacts, etc. all were silver plated and the whole thing was impregnated with some substance that looked similar to varnish, and which did an excellent job of preventing damage from moisture. This equipment gave very little trouble.

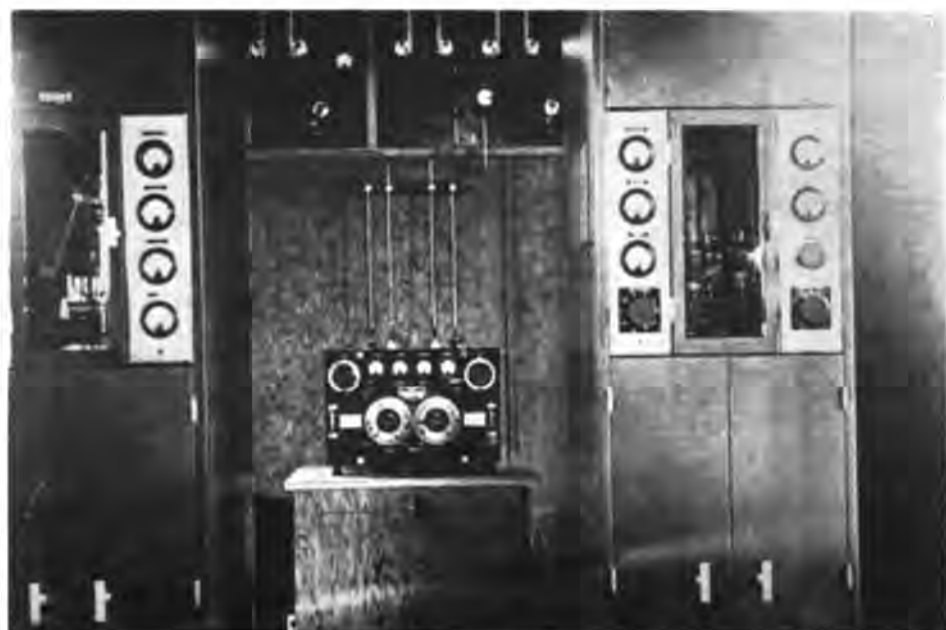
The four wires which guyed the short mast atop the center section also served as the two loops of the Bellini-Tossi radio direction finder. Four leads from these loops were connected to a goniometer at the radio operating position. The goniometer in turn was connected to an RF "loop amplifier" which could be hooked ahead of either communication receiver for direction finding purposes. This RDF was used mainly on 1638 Khz. but would take good bearings over relatively short ranges on frequencies from 300 up to about 2000 Khz.

The FRO's Position

The Flight Radio Officer's position was located on the starboard side of the flight deck, directly behind the co-pilot's seat. The FRO sat in a very comfortable leather-covered swivel chair, facing forward. (And directly in line with, and three or four feet away from the arc of number three propeller!) In front of him he had a small metal table with racks along the forward edge which held the



GRAY - PAA PIONEERS THE PACIFIC



Radio Transmitters at "KNBI" Pan American Airways, Wake Island 1935. Foreground - Western Electric 14-A Power supply unit at left, transmitter unit at right (about 450 watts) 9-Channel unit. Center on cabinet - PAA 100-G-2 100 watt, 2-channel. [Gray Photo]

two receivers, the goniometer, loop amplifier and pigeonholes for message blanks, log sheets etc. On the table top were two switches to control the transmitters, indicator lights to show when the dynamotors were running, and two telegraph keys. At first many of the FROs used conventional "bugs" but when one got loose in rough weather and nearly conked the First Officer, a shift was made to a light-weight type bug that could be secured easily to the table. Early on, traffic was copied with a pen or pencil. Later, when the B-314s were put into service, most FROs copied on a light-weight portable typewriter furnished by the company. Needless to say, these were well secured while being used in the cockpit!

LOCAL DISTRIBUTION Except at Midway and Wake, where the radio receiving room was in the same building with the Operations/Weather/Administrative office, local distribution of traffic was through use of private teleprinter lines. In the early days a few of the printers were of the "cut and paste" tape type; but these were soon replaced with page printers. Some were Model 15 Teletypes; others Model 19. Whenever conditions permitted, the operators copied off the air directly onto the printers.

System Expansion

As time passed, more ground stations were constructed. In early 1936 a small, one-position station with loop type RDF was installed on top of two of the highest hills in Portuguese Macau, about thirty miles south of HongKong. Its purpose was to guard flights on the western end of Manila/HongKong operations. A similar small station was put up a few months later at Laoang, Samar, P.I. Its job was to provide weather information and to support flights opting to approach or depart Manila via the San Bernardino Straits. Another one-man station, plus loop RDF, was located at San Fernando, La Union, P.I., to assist aircraft approaching the west coast of Luzon from HongKong. Along about 1937 a one-man station with loop RDF was put on Catanduanes island, off the east coast of Luzon. This station had a fairly powerful transmitter which provided signals upon which aircraft could "home" with its own RFD over distances of several hundred miles. This station proved to be extremely useful in supporting flights between Guam and Manila. And there was a one-man low power (about 20 watts) station at Infanta, on the east coast of Luzon, about ENE of Manila. Its purpose was to provide weather reports, and when flights were expected in the area, to report whether or not the cloud level was above the tops of the nearby mountains.

All of these small stations were manned by indigenous operators. They did an excellent job and were most dependable.



New Zealand Added to Schedule

In 1937 plans were firmed up for an air service to New Zealand. Originally the plans contemplated a route via Honolulu, Kingman Reef, and American Samoa. In preparation for this the facilities at Mokapu Point were beefed up and a new station built at Pago Pago. Kingman Reef presented a real problem and turned out to be a king-sized headache. The New York office had decided to utilize a wooden-hulled square-rigged sailing vessel, the "TRADEWINDS", as a base of operations. It was to be anchored in the lagoon at Kingman Reef, and the radio station along with other support facilities were to be located aboard it. The vessel was brought around to Hilo, Hawaii, where company technicians did their best to install an adequate aeronautical radio station and loop type radio direction finder. It is difficult to imagine a more unlikely site! Space available for the radio shack was barely large enough to turn around in. The power supply was unreliable and the voltage went up and down like a yo-yo. Antennae had to snake their way through the stays and rigging, and even though the best available spot was selected for the RDF loop, the performance of the RDF left much to be desired. The greatest deficiency, however, did not show up until the vessel was underway for Kingman. Then it was found that receiving conditions were extremely noisy. There was no common ground in the wooden structure and when it was dry each piece of metal would build up its own static charge. When the charge got high enough, or spacing between the charged objects changed, there would be a sudden discharge of static electricity which sounded like a crash of lightning in the receivers. Even the pots and pans hanging in the galley made electrical noise as they touched each other during the pitch and roll of the vessel. This station supported one or two survey flights and the company officials were still pondering what to do to improve the situation, when the survey plane (a Sikorsky S-42) exploded while landing at Pago Pago, killing Captain Edwin Musick and all hands aboard. This caused a decision to be made to not operate via that route. It was decided to operate instead via Canton Island and Noumea, New Caledonia. Accordingly stations utilizing standard PAA gear were installed at those two places. Service at Auckland was provided by a New Zealand government aeronautical station. A PAA radio operator was detailed to that station for quite a while for liaison purposes. As I recall, both Canton Island and Noumea had RDF capability, but am quite sure that neither had the HF Adcock system.

This brought the PAA communications system in the Pacific up to the configuration which existed when the Japanese struck at Pearl Harbor in 1941.

EQUIPMENT ADDITIONS

Two significant additions to equipment were made around 1937-39.

Along about 1938 the pilots expressed a need for a short-range radiotelephone capability to permit rapid communication among the aircraft, Flight Control Office and crash boats during departure and arrival. To satisfy this need the Chief Communication Engineer procured RCA aircraft gear having an output of about 15 watts and using amplitude modulation. It was fixed-tuned on 2986 Khz., using crystal control. These sets were installed in each aircraft, Operations office and utility/crash boat. Getting an antenna on the boats that would be effective on that frequency and still be small enough to permit the boat to maneuver under the wings of the aircraft was a problem that never was really solved. The arrangement worked after a fashion and there was voice communication between aircraft and ground; however, in my opinion, it left much to be desired.

The second equipment addition related to radio direction finding. As time passed, the navigators and pilots made more and more use of the aircraft's RDF. Whenever signals from a station were strong enough to permit bearings to be taken with the aircraft's RDF, those bearings were preferred over those taken by the ground station. Consequently around 1939-40 PAMSCO made available a new, more powerful ground transmitter, which, when used with a non-directional antenna, provided an excellent signal upon which the aircraft could take bearings at much greater distances than previously had been possible. The unit had an output of around 750 watts and was used mostly on 1638 and 375 Khz. I am not sure of its designation, but "8GL" comes to mind. One each of these transmitters was installed at Midway, Wake, Guam, Catanduanes, San Fernando, Canton Island, and I think at Noumea. During the war PAMSCO produced hundreds of these transmitters for the Armed Forces.



BOEING B-314 "California Clipper" [NC 18602] at Cavite, P.I. March 2 1939. Alman A. Gray Photo.

Capture by the Japanese

WAR Within a few hours of the Japanese attack on Pearl Harbor they also bombed and destroyed the radio facilities at Wake. The stations at Guam and in the Philippines were captured a few days later. I do not know what happened to the stations at Midway or Macau but they were not used further, and PAA radio service ceased in the north Pacific west of Hawaii.

The stations in the South Pacific remained intact, and after being augmented by several additional stations, supported operations of the Naval Air Transport Service in the area until 1944-45. Charlie Wertman, ex-FRO, former Marine, and a graduate of the Navy Radio Materiel School, had direct responsibility for PAA communications support of Naval air transport operations in the area and did a superb job. Even though he was a civilian, he frequently was much closer to the combat zone than many of those in uniform.

Coordination With AACS

In 1944 the Commander-in-Chief, Pacific Ocean Area, established the Joint Airways Communications Service, Pacific (JACSPAC), operated mostly by the Army's Airways and Air Communications Service (AACS). It was given responsibility for the communications support of all air transport operations in the Pacific theater. That virtually marked the end of PAA's aeronautical communications system in the Pacific. It never was reestablished.

Personnel-Pre-War Pacific Division

Some PAA radio personnel were victims of Japanese actions. George Miller, who was on temporary duty at Cavite, reportedly was seen with the U.S. Naval defenders of Cavite. As far as I know, nothing has been learned about him since. Del Axe, who was Supervisor of the Manila Section, was captured and interned for the duration in Manila's Santo Tomas prison camp. The entire Guam staff was captured. I was told after the war that one of the operators, I think his name was Funston, died when the Japanese ship in which he was being transported to a prison in the home islands, was attacked and sunk by American forces. I cannot recall the names of the others, nor do I know their fate.

PEOPLE I do not remember by name all of the communications people who were in the pre-war Pacific Division. However, by drawing heavily upon Ralph Conly's compilation of PAA communications personnel system-wide, I have come up with the following partial listing. Those names preceded with an asterisk (*) are known by me to be deceased. Footnotes are at the end of the section.

Division Headquarters, Alameda / Treasure Island

- * 3 George W Angus Comm. Supt.
- Estella M. Hall Secy. to Supt.
- Almon A. Gray (810-P) Asst. Comm. Supt.
- Ellen Belotti Secy.
- * Kenneth C. Ambler Special Asst.
- * John D. Poindexter Chief FRO
- * Graham Edge Ch. Acft. Rdo. Maint.

Manila Section

- * Del Axe Sect. Supv.

Gnd.Stn.Oprs., FROs, Rdo. Mechs.

- | | |
|-----------------------|--------------------------|
| Abernathy, J.C. | Anderson |
| Arvidson, R. | Atherton, G. |
| Baxter, G.E. * | Bell, W.H. |
| Best, Dick * | Beideman, Addison. W. |
| Blaker, H.T. | Breuer, William |
| * Campbell, Roy | Casselman, John |
| Castaneda, Carlos | Charman, Lanham |
| Chung Fat (Macau) | Comer, W.C. |
| Conklin, George | Cooke, John B. Jr. |
| Cummings, Stan | Cushman, James J. |
| Darrow, Paul | Dickey, Larry |
| Dickson, R.G. "Baldy" | Dixon, F.C. |
| Eichel, Joseph | Elliot, Gordon |
| Feliz, Sisto | Fernandez, Edwardo |
| * 1 Findley, Thomas | Fleming, Roy |
| Funston | Gentry, Herman O. |
| Hansen, R.C. | Harper, Paul |
| Hinkel, John | Hobdy, W.W. "Lem" |
| Hogan, Frank | Holliday, Harlan |
| Hrutky, John | Hrutky, Ted |
| * Jarboe, Wilson T. | Lanik, Bob |
| Light, James | Li Tin Hung (Macau) |
| Lockhart, Robert | Mackay, Donald |
| * 2 McCarty, William | McClellan, "Red" |
| * 4 Miller, George | Monnett, Larry |
| Mussels, H.C. | Nolan, Arthur B. (372-P) |
| O'Brien, Dennis F. | Paulson, Leroy D. |
| Penning, Floyd | Ray, Charles |
| * Runnells, Ray | SantaMaria, Roberto |
| Schwella, Frank | Shaw, Harry |
| Smyser, Jack | Streib, Fred |
| Strickland, H.D. * 3 | Thompson, Clarence F. |
| Wenkstern, Zenith L. | Wertman, Charlie J. |
| Williams, Vernon N. | Zentner, Robert |

- Notes**
1. Killed in explosion Samoan Clipper
 2. Lost with Hawaii Clipper
 3. Killed in crash of Philippine Clipper
 4. Killed or died while Japanese captive

I am sure I have not listed all the names that should be mentioned. I hope that those whose name I have missed will be charitable. After the passage of forty-eight years, names and faces are getting a bit dim.

EPILOGUE

The flying boat era in the Pacific was a short but exhilarating period. It had all the glamor, adventure, risks and rewards associated with the earlier era of sailing clipper ships. And, like the sailing clippers, trans-Oceanic flying boats probably never again will be seen outside of a museum. Certainly all the communications people of the pre-war PAA Pacific Division justifiably may be very proud of the major role they collectively played in the events of that era.



WILSON TURNER JARBOE, JR.

1907 - - - - 1978

Pan Am's Veteran "FRO" who was at the 'key' of the "CHINA CLIPPER" on her inaugural flight across the Pacific and return. It left S.F. Bay Nov. 22 1935, returning Dec. 6 1935 - 14 days and 16,420 miles later. It was a 'first' in Aviation and in Communication History. CX.

Editorial Comment

Member Al Gray's historical report on the pioneer days of Pan Am in the Pacific and the part that radio played is what the Society is all about. When those who played such an important part in world's history, pass on without having it recorded, we lose too much of our heritage.

We think Mr. Gray's article is a fine example of what we are trying to 'get across' to both members who can still furnish documentation of these early days and to others who enjoy reading these articles on our heritage. This is a wonderful story and we are especially proud to present it in this issue.



Saga of the Pioneer Days in Aviation Radio



The CW (and Phone) Ops of NWA

BY
BOB KUEHN WÖHKF

Northwest Airlines was one of the first of the major airlines, having begun operations in 1926 with a fleet of three 85-mile-an-hour Stinson Detroiters, each carrying three passengers. In just a few short years, radios decreased in size and weight and airplanes grew large enough so that airborne radio communication became possible, and by the time Ford trimotors came along in 1930 the art was becoming well established.

The following 18 years saw rapid development in both airplanes and radio gear and by the end of the decade and the start of World War II, the DC4 and the Boeing B17 Flying Fortress were already in service, with multi-channel crystal controlled radios to match. On the airlines, radiophone operators maintained contact between the ground station and the airplane and the CW ops worked point to point, i.e. between ground stations.

When I started with NWA in 1941 there were three main stations, at Chicago, Minneapolis and Seattle, all with separate phone and CW positions, while at the line stations one op performed both duties. Indeed at most line stations the radio op was the only person on duty and besides maintaining a radio watch he also sold tickets, booked passengers, loaded baggage, gassed the airplane, handled the mail, took weather observations and swept the floor.

Incidentally, in those days Uncle Sam required that anybody handling the U.S. mail had to be armed, so every captain had a loaded revolver strapped to his waist. (where are those sidearms now when they could really be used?) Line stations were likewise required to have a weapon available. When I did a stint of duty at the mountain station of Missoula in western Montana, besides the shotgun behind the station door which was used against errant porcupines, coyotes and other varmints, they also had a regulation 45 calibre service revolver. When I first came to Missoula I noticed a neat, round hole right in the center of the large window overlooking the field. The story behind it was that one of the ops, Wilbur Talbott, was idly whiling away the tedious dog-watch hours aiming at the blue obstruction lights beyond the window when he squeezed the trigger just a bit too hard and the piece fired. Fortunately he missed the obstruction light or that would have been taken out of his pay too!

When the airlines first began hiring radio operators the only existing pool they could tap were the marine operators, some of whom had been around since the very beginning of shipboard radio back around 1910. In our part of the country marine meant the Great Lakes but in any event they, too, left their mark on aviation and to this day every airplane is called a ship and it has bulkheads, a flight deck, a galley and stewards (or stewardesses).

Marine radio ops were ship's radio officers and although they were stripped of their rank when they came to the airlines, they did retain the uniform, only with one stripe on the sleeve compared with co-pilot's three stripes and the captain's four. He still filled an important niche in the scheme of things, however, since from the time an airplane took off until it landed the only contact the pilots had with the ground was with the airline radio op.

By 1940 Northwest Airlines flew from Chicago to Seattle aided by a CW circuit between the following stations:

CG—WSDS	RK—RNWD
MK—WAEH	ML—KNCV
MA—WAVM	BI—KGSK
RR—KARR	BT—KARB
MP—KNWA	MX—KGSX
PO—KNWB	SM—KGSX
	SA—KGSZ

Real, honest-to-goodness old fashioned call signs and just like BC stations, those east of the Mississippi River began with W and those west with a K. If you don't remember the pre-war two letter designators the above, in order, are Chicago, Milwaukee, Madison, Rochester, Minneapolis, Fargo, Bismarck, Des Moines, Billings, Butte, Missoula, Spokane and Seattle. NWA went to Portland and Wenatchi and a few other places too, but I've forgotten their calls now.

NWA - RADIO OPERATORS - MSP



Of course everybody on the CW circuit used a vibroplex or 'bug' in those days and although we had some banana boat swingers among the ex-marine guys, by and large it was a good, fast circuit. Although I had been on the CW hambands for 10 years before signing on with Northwest, I really had to sweat at first to keep up. I remember among the first things I had to do was take my bug over to radio maintenance and borrow a hacksaw to cut the dot weight in half because it wouldn't speed up the dots enough. Even with only half a weight I habitually ran it within a quarter inch from the top in order to sound like one of the boys. One day when we were in our prime four or five of us were sitting around shooting the bull when the question arose of just how fast continental morse could be sent with a bug. After we all gave it a try, watches in hand, the answer was—45 words per minute.

So I suppose that in spite of the blindingly fast dots that were used, the average speed on the circuit was perhaps around 35 wpm. The bulk of the traffic was passenger reservation messages with a smattering of maintenance and company business traffic. Flight plans, clearances and dispatches went via radiophone. It's a little hard to remember the channels we used after the lapse of years, but night CW was 2994 KC and night phone was 3005 and one of the day time channels was 5491.5 KC. In the mid 1930's when things were just getting started, the sunspot cycle was a minimum, conditions were good and things looked great for airline communication. But beginning with the 1940's things were on the downswing and there were often days on end when an airplane took off and we never heard them again. CW traffic, for the duration of blackouts was phoned to Western Union and the CW ops had nothing to do until signals improved again.

When war came airline operation, like every other aspect of American life, underwent drastic changes. Within days of Pearl Harbor the government requisitioned every commercial airline fleet. Every airplane Northwest owned was lined up on the MSP field and when it was over we were allowed to keep a grand total of two DC-3's and one Lockheed 10-A. Even so, we did better than Mid-Continent, the other MSP-based line, because they were only allotted one plane to maintain their schedule with! Mid-Continent in later years was taken over by Braniff, with whose recent history I'm sure you're familiar.

The war years were stirring times to those who stayed home and kept the county running as well as for those who went off to war. The government set up an outfit called Air Transport Command (ATC), a quasi-military group composed largely of airline pilots and radio ops called PRO's, for Flight Radio Ops. They ferried all manner of airplanes and supplies here and around the world. We were given one common all-airline frequency at 8700 KC for general CW communication which we worked the ATC boys on and also used for point to point among the different airlines, sometimes much like a ham radio circuit. When the Japs attacked the Aleutian Islands there was a crash program to build the Alcan trans-Canada highway to Alaska, and Northwest was given the job of setting up an airline up through Regina, Edmonton, Whitehorse, Anchorage and out the Aleutian chain to Cold Bay and Shemya. There were CW ops at each station, of course, but by that time HF conditions were so bad that we rarely heard them. VHF was a little in the future and VLF would have solved the problem, but it really didn't get started until the war was nearly over.

Girls, naturally, was the answer when most of the boys went to war. Girl radio ops were turned out en masse by various schools around the country. Most of ours came from Midland Radio School in Kansas City and their school yell, we soon found out, was "Three dits, four dits, two dits, dah; Midland, Midland, rah! rah! rah!". But CW is somehow alien to the female chemistry and I would guess that somewhat less than 10% of them ever became anything like proficient at the art. Many of them, however, did make excellent radiophone operators and a few of them are still on the job to this day.

Minneapolis, Northwest's home base, is just about in the center of the country and was considered about as safe as a place could be from enemy bomber attack, which was a real possibility during the early war years. So our field was picked for a variety of interesting goings-on that we could see from our upstairs hangar window. Like one day they set up two poles on the field, with a wire between them from the center of which was stretched a long nylon rope, which in turn was fastened to the nose of a wooden invasion glider. Then a DC-3 with a hook fastened to its tail swooped low, engaging the cross-wire and snatching the glider into the air. The airplane shuddered and slowed down but the nylon rope had a lot of stretch so the trick worked and doubtless was put to good use somewhere in the war theatre. Jimmy Doolittle's B-25's were modified here (special fuel tanks) before flying off to Shangri La to bomb Tokio for the first time and we saw them all fly past our window on their way to making history.

But our field, like all the others, was blacked out at night and airline operation was suspended at dusk. The tower guys went home at 11 p.m. But military operations went on, and occasional assorted airplanes of all kinds staggered in during the night hours, feeling for the ground with their feeble runway lights. We weren't allowed to transmit weather for fear of interception by enemy aircraft. Instead we were given little folded cardboard devices which enclosed 7 paper strips containing numbers and letters. In the face of the folder were two rectangular windows and when the strips were lined up so that, for instance, 9925W10 (Kollsman 2292, wind SW at 10) appeared in the top window, we transmitted the 7 seemingly random numbers which then appeared in

(Continued Next Page)



NEW STATION at Fargo, ND 1939. Picture from Bob Koehn.

NWA OPERATORS - KUEHN

the bottom window. When the receiving co-pilot then lined up his strips to the same 7 numbers, presumably his top window, too, ready 992SW10. In retrospect it's a good thing there weren't any Jap bombers around because then everybody would have been confused!

As a typical airline, with two DC-3's and one 10'A, obviously we couldn't carry many passengers and those who did get on were practically all priority passengers. The government set up four class of priority, in descending order, WARAA, WARBB, WARCC and WARDD. The highest priority was apparently strictly for generals and most of our passengers fell into the WARBB category, commonly called "War babies". But in those days there were thousands of trains clogging the railroads and those who couldn't wrangle a priority classification cheerfully took a train.

The dawning of August 14, 1945 saw the end of the war, the point of highest development of airline CW circuits and also the beginning of their end. We had two CW positions going 24 hours a day in the MSP Ad building at Wold Chamberlain Field. The transmitter building was a half mile away in the middle of a field, surrounded by 60 foot telephone poles bearing half, wave center fed dipoles for each channel. Each channel had its own rig, too, with 3 KW Collins transmitters using Eimac 450-TL's modulated by 813's in Class B for the phone rigs. In those days most of the ops were young, with still keen hearing and we customarily just hung the cans around our necks while on the circuit. Break-in was flawless, but was seldom used for asking for repeats, which was the mark of a lid. Rather it was used for confirmation, that is, when the transmitting operator sent a long, unfamiliar name like Gryzbowski he would pause for a split second, during which the receiving op inserted a single "dit" to indicate he had it OK and transmission was immediately resumed.

It was a great life for a radio op but all things come to an end and with the war over, Model 15 Teletypes machines immediately became available for civilian use and that was the end of CW on the nation's airlines. Nearly all of the girls soon quit to get married or go back home and most of the CW ops managed to one way or another make the distasteful transition to full time radiotelephone operating.

In the meantime there had been an American Airlines FRO named Milnor Senior ("Mil" to us) who took leave of absence from his job and began to form a nation wide radio and teletype operators union, the Airline Communication Employees Association (A.L.C.E.A.). From the very beginning it was very successful and soon signed up the radio and teletype ops of every major airline in the country, seven or eight of them belonged to the union during the 1950's and 1960's. Mil was a very capable and intense individual, respected and in some cases, I'm sure, feared by the airline executives he faced daily across the bargaining table.



A group of 'Old Timers' from N.W.A. radio circuits meet in St. Paul Jan. 1960 for reunion. Those attending L/R: Joe Proeblich, Bob Kuehn, Clyde Norton, Jim Paist, Milt Anderson, Bert Quam, Ray Weihe, Tom Wynn and Clete Bellinger.

So the airlines prospered, the radio ops enjoyed substantial annual pay raises plus other benefits and once again we were one big, happy family. Oh, there was always one threat or another to our jobs looming over the horizon--Air Traffic Control (ATC) was going to take over pilot-to-ground communication, or every airline was going to scrap their radio circuits and buy service from Aeronautical Radio, Inc. (ARINC), which some did, to be sure, but what finally spelled the end of the traditional airline circuit was the advent of microwave Bell telephone service. ARINC could then offer their services more cheaply and most airlines promptly fired all of their radio ops, scrapped their beautiful radio gear and signed contracts with ARINC. Our line took a different tack however. One by one the line stations across the country were shut down and replaced by small, unmanned VHF rigs, remotely controlled from MSP via telephone lines. By 1962, instead of the 150 radio operators that NWA had on its rolls in the halcyon years, there were a scant dozen or so survivors, all based at MSP.

Now, instead of a pair of glowing 450-TL's firing into a No. 8 copperweld Zepp antenna, when a foot pedal is pressed a string of 25-watt pipsqueak VHF rigs is audible for a few miles along the airway. For almost 40 years there have been no airline CW ops and the tradition is barely kept alive by the three dozen or so radiophone operators still employed by Northwest, Delta and Eastern Airlines. RIP!



NWA CW STATION at Portland Oregon (PDX) 1940. Operator not ident.

Brief History - FRO's of NWA

Pioneering - Northwest-Orient Airlines

BY - W.S. SKEEN

Although Northwest (NWA) was a relatively late comer to overseas operations, they had done some of the pioneering on the Aleutians route during WWII, and were in a good position to bid on the great circle route to Japan. They began scheduled flights in 1947, the Orient flights originating in Minneapolis, stopping at Edmonton, Alta. for fuel enroute to Anchorage, landing at Elmendorf Air Base.

From there, stops were made at Shemya near the western end of the Aleutians, Tokyo, Okinawa, and Manila. Connecting flights were flown from Tokyo to Seoul, Korea and to Nanking China, until the Communist takeover.

Although the plans were to use Boeing Stratocruisers on the route, persistent engine troubles with these planes forced the use of DC-4s (C-54). These were not pressurized, and oxygen masks were issued to passengers when conditions required flying at 14K feet in northern Canada and Alaska. They were comfortably fitted, however, with only 32 seats that reclined nearly full length.

Initially, the radio equipment included a BC-348 receiver and a Collins ART-13 transmitter. This was later supplemented by a crystal-controlled Collins transceiver. On the older DC-3s that flew the Korea route, there were some ARC-5 setups, and even BC-375s!

NWA used CW on the overseas routes from the start in 1947 until 1950, at which time the Flight Radio Officers (FROs) were laid off in favor of radio telephone. Minneapolis-based FROs deadheaded to Anchorage, then picked up the next flight to Shemya, where they again laid over until the next trip to Tokyo. As there were only three round trips a week, there was plenty of time to fish in Alaska, shoot pool in Shemya, and shop the Ginza in Tokyo. Tokyo-based FROs continued on down to Manila or the connecting routes to China & Korea.

Originally, NWA had their own company ground stations at Anchorage, Shemya, and Tokyo, etc., but the operation was later taken over by ARINC (Aeronautical Radio).

(Continued on Page 24)

FRO's - NWA - SKEEN

(Continued from Page 23)

Flying down the "chain" to Shemya, we had to make half-hourly contacts with AACS, in addition to CW contacts with Anchorage and Shemya. For weather, we copied CW broadcasts from KIS in Anchorage (CAA) as well as weather from our own stations. There was also a weather net down the chain, operated by AACS. Each station in turn transmitted its weather, using morse characters for "overcast", "broken", etc. This was sent at good speed, and it was a pleasure to copy it.

Landings at Shemya were usually via GCA (Ground-Controlled Radar), as conditions were often marginal, as may be imagined. The GCA operators were sharp and knew their stuff. Occasionally, Adak was used as an alternate on return flights from Tokyo. Instrument landings here required making a turn while down between mountains, relying on GCA not to pile us up.

The flight to Tokyo departed Shemya about midnight, and took about twelve hours. This was a long drag, and some of us became adept at dozing fitfully but always snapping alert when called. Traffic mostly consisted of the usual POMAR message (a coded message giving fuel remaining, consumption, air speed, etc.), although the weather had to be copied every hour, and there were clearances and meteo forecasts from company dispatchers and meteorologists. We had company VHF and often contacted a returning flight as much as a thousand miles away or more, receiving information on where the best exchange rate for Yen could be had. American cigarettes were in great demand in Tokyo, in 1947. We could buy a whole case of moldy, stale Philip Morris cigarettes in the PX at Shemya and sell them for a fantastic price in Tokyo. I won't go into the details on how we got them past customs at Haneda Airport.

A round trip to Tokyo took about 65 hours, and since we were limited to 85 hours flying time per month, we had plenty of time at home. This did not apply to charter operations, though. There was no change of crew on these. Although there were three pilots on these flights, the FRO and Navigator were expected to do the whole thing without a break! On one occasion, I was so exhausted upon reaching Tokyo after 32 hours without a break from Minneapolis that I tried to quit, there and then. Since they couldn't go on without me, we took a short break of a few hours.

NWA maintained a good safety record during the time FROs were carried, and there was no loss of life on the part of the Flight Ops. There were a couple of charter flights that piled up, however. I narrowly missed being on one of these. A tanker crew off a tanker that had been sold to China was being returned to the States. We were short of FROs at the time, and I had heard via the grapevine that I would be lucky to get two days at home. The FRO ahead of me had been turned around and sent back to Tokyo. Since there was no FRO with his crew who would be picking up our flight on arrival at Anchorage, I requested to deadhead home with them instead of laying over with my crew. This request was at first refused, but I was lucky enough to run into a company official whom I had known for many years. He OK'd the deal for me. The next morning in Minneapolis, I was shocked to hear that my crew had piled into the side of 16,000-foot Mt. Sanford, NE of Anchorage. From then on, flying with me was considered almost as good as carrying a rabbits foot.



Crew Quarters for NWA flight crews, Shemya, Alaska. Leased quonset hut from the AAF. Note caption above door. L/R - Un-named co-pilot at left, FRO C. G. "Chuck" Ketterman at right. Photo from W.S. Skeen, SOWP Member 2343-P.



Approaching Haneda Airport, Tokyo, Japan across Tokyo Bay on the FIRST scheduled flight from Minneapolis, Minn. June 1947.



First Graduating Class from Northwest Airlines ground school for Flight Radio Officers, St. Paul, Minnesota, 1947. Names L/R [*] as follow: Glen Peterson, Stanley Kahn, C.G."Chuck" Ketterman, Joe Burris (?), Ray Pelland, CHOP Fred Bolduan, Howard Mundie (?) Glen Malmin, ----McCormick (?), [----] . Bill Gorby, W.S. "Bill" Skeen, Bob Wilson. [*] NOTE: Photo furnished by Bill Skeen, Author of article. Bill says that he has had to use 'nicknames' in some cases and tried to indicate correct spelling. Unable to identify the FRO fourth from the right.

FAA'S INSTRUMENT LANDING SYSTEMS

By Vic Clark

My involvement with CAA began in 1941, a few months before the start of World War II, as an Aircraft Communicator, first at the Communications Station in Parco (now Sinclair), Wyoming, then at Overton, Nebraska, and Columbia, Missouri. In early 1943 I had the opportunity to transfer to Washington, D. C. where I became a member of the old Signals Division, later the Radio Engineering Division of CAA at the Stanley-Horner building on Fourteenth Street.

My earliest assignments there were concerned with providing radio equipment for the airport control towers and compass locator stations, but shortly afterward I was transferred to the group handling the infant instrument landing system program. I served for a time as assistant to Pat Bowser, and later . . . when Pat left for private employment . . . I became chief of the group that included a great many of CAA/FAA's finest electronics engineers, including Paul Glassco, Ray Anderson, Carol Swain, Ralph Jordan, Lou Wolfe, Leo Wilber, N. C. Defibaugh, Chet Bartholomew, Milt Roth, Leon Pelzman, Jack Farrance, Charlie Albee, Harvey Butts, Harvey Bresler, Marv Anderson, and so many more.

My ten years with the ILS program spanned its progression from the initial experimental uses by specially-equipped airline aircraft to more than a million routine airline ILS approaches per year. Scrupulous attention was given during this period to assuring system reliability by designing into the specifications a margin of performance safety for every component in the tailor-made equipment provided by contractors from all over the country. Government procurement procedures today could take a page from CAA's book.

Knowledgeable engineers prepared every detail of the specifications, building upon the experience gained in previous years, they visited the factories and witnessed exhaustive environmental testing of every item of equipment used in the instrument landing system, developed detailed installation instructions for field use, and subsequently gathered field performance data to spot weak links, thereafter developing prompt corrective measures for them. All of this information and experience was ploughed back into the subsequent year's specifications, so that each successive generation of ILS equipment benefited from the lessons learned in use of prior models. While some of our contractors weren't too happy with the exacting inspection to which their products were subjected, we never lacked for bidders and the result was a bargain for the taxpayers. The proof of the pudding is in the fact that the ILS today still em-



VICTOR C. CLARK

SOWP 3722 V

"Vic" Clark, now known internationally as President of the American Radio Relay League [ARRL] won the election and became President in April of this year (1983). While Amateur Radio has been one of his prime interests since 1933, he has also enjoyed a very outstanding professional career after graduating from George Washington University. He spent from 1941 to 1943 at field stations of the CAA (Now FAA) as operator and Chief at stations in Nebraska and Missouri. His ability in the engineering field was recognized and he went to Washington where he served as Chief of the Instrument Landing System Branch for many years. Later he spent eleven years as Director of the U.S. Coast Guard's Electronics Engineering Laboratory. He is a senior member of IEEE and a holder of the Hiram Percy Maxim Award [1937].

loys many of the components purchased decades ago, the remarkable progress in electronics development notwithstanding. The basic ILS design, derived from the Germans' Lorenz system back in the late 1930's, and developed for practical use by the CAA's old Technical Development Center in Indianapolis, still functions today at hundreds of airports all around the world.

Numerous competing systems were offered along the way, including the Ground Controlled Approach (GCA) radar landing system developed for the Military, but none of them has yet succeeded in dethroning the decades-old ILS.

The CAA's policy of purchasing the ILS ground station in thirty to forty separate equipment procurements provided a wealth of bidders. Small companies could select the item or items best suited to their resources, with the result that each design received a good deal more engineering attention than would have been the case had the entire system been purchased from a single large supplier. Only a couple of companies were in a position to undertake the entire system, whereas the competition for contracts for the various component items among several smaller firms yielded far more favorable prices to the government.

A book could be written about the events of those ten years. I can recall a visit to our early trial installation at New York's JFK Airport, and spending some lonely evenings at that airport working in the localizer shelter when it was the only structure on the entire airport property. Try being the only person at JFK today!

On one occasion we had an inspector ejected from a plant for being "too tough", and another case in which the inspectors' arrival at the plant was routinely announced over the public address system, presumably to put production people on notice that surveillance of their activities was about to begin.

Engineers from the ILS group were rotated among plants from time to time to prevent what we called "an acute case of contractor's viewpoint." We were sued by a bonding firm for one company eight years after cancelling a contract for non-performance, but were able to convince the court that CAA took the proper action. On one occasion, three of us surreptitiously carried the CAA's equipment out the back door of a foreclosed plant, while the sheriff was trying to gain entrance at the front . . . all in the interest of avoiding installation delays at important airports.

So anxious were municipalities to have an ILS installed at their airport that we were often able to influence the location of new airport buildings so that they would not adversely affect ILS radiation

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Saga of the Pan American Air Ferries

As a maritime Sparks from 1925 thru 1933, and sporadically thereafter on ATS, MSTs, and foreign-flag cruise ships, aviation radio was new to me. Altho I ended up in 1933 as Chief on the biggest U.S. ship at that time, the WASHINGTON/WLEE, I decided I didn't want to spend the rest of my life at sea, so went ashore, organized the port of New Orleans for the union (ARTA), worked at two broadcast stations, then was introduced to aviation radio by Eastern Air Lines. I was assigned to Chicago at the old Midway Airport, about 1936.

Our work was mainly copying the weather forecasts on CW and relaying them to incoming pilots by radiophone. Was offered a job in Miami, so I soon resigned, and it was not until 1942 that three of us oprs. left Tropical Radio/WAX at Miami to work for Pan American Air Ferries, flying in twin-engine bombers to Africa across the South Atlantic via Brazil, during WW II. The pay and per diem were big attractions. Our boss was SOWP Sr. V.P., Pete Fernandez, ex-PAA. Altho the other two TRT oprs. were later lost in crashes, I survived.

PAA Ferries delivered over 500 twin-engined bombers, mostly lend-lease, during 1941 and 1942 to our allies in Africa and Asia. Takeoff was at night, the plane warming up in pitch black darkness, and landing in Trinidad in the morning. Next stop was Belem, in Brazil, for a stay of two or three days for maintenance. Then on to Natal, on the hump of Brazil, where we waited for favorable winds for a night flight across the Atlantic.

Manuel 'Pete' Fernandez Pioneered Route

Due to the shortage of radio oprs., only one was carried in the average flight of five bombers, so that at each stop we had to service all aircraft and set up the frequencies for the next airport. Communication between planes was by phone, and with shore by CW. Arrival off the coast of Africa was sometimes in foul weather, perhaps with the RDF soaked and unusable and gas running low, so we had to go down and follow the coastline to Roberts Field, Liberia, or Accra on the Gold Coast. Pete Fernandez pioneered this route and flew in the first batch of junk Lockheed planes they were flying to the British. The company was called Atlantic Airways at first, but soon the name was changed to Pan American Air Ferries. In late July, 1942, an airfield on Ascension Island in the middle of the Atlantic was built, so we could gas up and arrive over Africa with a margin of safety.

From Accra we flew thru Nigeria, Chad, the Sudan, and Egypt to Cairo and delivered the Hudsons to the RAF. They used these to push back Rommel from the gates of Cairo. We also ferried B-25's, B-26's and A-20's to

the Russians in Tehran, Persia and Basra, Iraq. The Vega Venturas we delivered to the South African Air Force at Accra. DC-2's and DC-3's were for PAA Africa, which flew priority freight all over Africa and returned to Miami. Ten PB5A amphibians (Catalinas) were to go to the Dutch Navy in Indonesia and Ceylon.

Perusal of some of the communications sheets I turned in at the end of a trip reveal such statements as "Beat note on freq. meter inaudible unless body used as ant. Suggest longer wire to ant. on meter. Oprs. shud be told to stand up and put hand on ant. of freq. meter and foot on key when tuning."; "Belem not listening to Ferry freqs. as per memos.", etc. The throat mikes on the B-25's were so poor that we either brought our own mikes or rigged up a clothesline to pass notes to the cockpit from back aft in a B-25 where the radio opr. was hemmed in by an extra gas tank.



PAA FERRIES
B-25-C # 112546 G
GUARDED BY ASKARI
TROOPS IN NIGERIA

DELIVERED TO THE
RUSSIANS AT TEHRAN
IRAN

DON THOMAS - PHOTO

My Final Trip

One trip on a Hudson was eventful. We were flying at midnight in the middle of the Atlantic with all lights out and the radio turned off to save batteries, as our generator was not charging. Nothing for me to do, so I was asleep on the cabin floor by the toilet can. The copilot was asleep in the navigator's seat, the navigator was flying the plane, learning, when the pilot came back for a leak. Suddenly both engines quit and the plane started swooping and diving while the navigator struggled to control it. The pilot and I rushed up to the cockpit. While I was noticing the stars going round and round and wondering where the liferafts were stowed, and how do you operate them, I asked the pilot if he wanted lights. No, no, he said, "Do you want an SOS?" No, no, was the reply, as he continued fiddling with the dials on the control panel. Finally the engines started again and we levelled off about 1000 feet over the water and started climbing back to 9000. Some of the crews didn't want to fly with that pilot again after learning he had switched on an empty tank after using up another tank.

Less dangerous was my final trip on PAAF, which ended in a crash. We were ferrying a PB5A amphibian for the Dutch Navy in Ceylon. We stopped at Gura, Eritrea, in the mountains, for a mechanical check, and after three days, took off for a short test flight. The pilot and I both invited friends, and the mechanics who had worked on the plane hopped aboard for the flight. We ended up with 13. Altho I suggested on the interphone that we might be overloaded, the pilot assured me that he had flown these PB5's for KNILM in the Dutch Indies with that many aboard with no problems. However, he had gorgotten that this was an amphibian, not a seaplane, and that our airport was at a high altitude with thin air and a runway sloping

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PAA FERRIES - B-25-C # 112537 DELIVERED TO THE RUSSIANS AT BASRA, IRAQ - 1942. PICTURE BY DON THOMAS, FRO.

Adventures in Flight Don Thomas

(Continued from Page 26)

upward. In the heat of the day, we hadn't much lift. So when we could only get up a few feet on takeoff at full power and started hitting bushes and haystacks the pilot tried to turn back. We ended up in a crash with the hull turn open and one wing broken. We all got out safely and watched gasoline pour out of the wing-tank, but no fire resulted; we had cut off all electrical switches. Our only casualty was the navigator, and he was not aboard for the trip. He saw us crash in a cloud of dust a mile away and started running to the site. At that altitude he soon passed out by the side of the road and was picked up by a passing jeep.



PBY-5-A Amphibian for delivery to Dutch Navy in Ceylon. Crashed at Gura, Eritrea, Oct. 31 1932. Photo by Don Thomas.

1942 Army Air Force Takes Over

The Army Air Force took over all ferrying operations late in 1942, so we all had to look for new jobs. I was offered a commission in Naval Air, and was sent to Naval Air Navigation School and was assigned to Pensacola NAS training air navigators in a PBY squadron and incidentally, hunting submarines in the Gulf of Mexico. Radio work was mostly using the RDF's for fixes. The enlisted radiomen provided communications and got compass bearings when needed. Static in thunderstorms was sometimes so bad that we could only home in on radiobeacons to return to base.

In 1944, the Navy requested that older Volunteer Specialists such as I was, should ask for inactive duty if they thought they could help the war effort better out of the Navy than in it. They were anxious to employ some of the surplus younger pilots as instructors. Merchant ships were being held up for lack of radio oprs., so I asked for inactive duty and went out on two convoys to Europe and a fast C-2 freighter to the Med. before V-J day. Then, I thought, the excitement was over.

Fun (?) as 'FRO' on Skyways International

But it was not to be. After working for Tropical Radio again, then sailing on a couple MSTS ships taking displaced persons to South America and New York from



Don Thomas, Radio-Navigator PAA Ferries observes giant ant-hill on stop-over in Africa on one of his numerous flights



WELCOME INTERLUDE

Don Thomas, Radio - Navigator, PAA Ferries, "Home from the wars" enjoys reunion with young son Marshall. Aug. 15 1942.

Germany, I was back in aviation. I flew as Flight Radio Operator for Skyways International, a charter airline out of Miami, which specialized in trips around the Mediterranean. We flew aircraft engines to Saudi Arabia, rugs from Teheran to Israel, and immigrants from Rome to Venezuela via Scotland, Iceland, Greenland, Newfoundland, and Bermuda. The aircraft radio duties didn't vary much from the WW II days; same equipment, more or less. The only excitement was when we lost an engine on a C-46 Commando with a load of heavy freight over the Mediterranean. Losing altitude by the minute, we had to decide quickly - Greece or Italy, then headed for Brindisi, Italy. After getting Brindisi on the radio and explaining in very broken Italian, that one "motore" was no good and we were landing there they were surprised to see we only had one good engine left. They had assumed we had three engines, like many Italian planes.

One trip, returning to the U.S. we were nearing Greenland, admiring the beautiful coastline with miles of white glaciers glistening in the sun. The plane suddenly filled with smoke. When I was trying to find out where the fire was, the pilot said he had turned on the heat, and the smoke was just some new paint burning off the heaters.

SKYWAYS finally went broke and had five aircraft sitting on the field at Rome. Five crews took one of the planes and we flew it back to Miami. Most of us never got our final pay. I was offered a job in the State Department's Foreign Service, so spent the next 15 years in communications work in Spain, Indonesia, Panama, Taiwan, Dominican Republic, Nicaragua, Brazil, and Florida, finally retiring without getting involved in aviation radio any more.

Am now active in the Florida Aviation Historical Society and writing articles for the American Aviation Historical Society's JOURNAL on aviation history, and in airmail and aviation hobby magazines on my specialty old airline timetables and baggage stickers, as well as steamship postcards and baggage stickers and brochures.



Manuel "Pete" Fernandez closed his telegraph key for the last time on Sept. 18 1983 in Greenville, S.C. The Legacy Pete leaves is one of outstanding accomplishment in the fields of Communications, Aviation and in the realm of the Nautical World. His life touched and enriched the lives of thousands who knew him. I was honored to be among that group. Most outstanding accomplishments included establishing of bases during WW-2 across the South Atlantic to Africa and beyond for a vast Air Ferry Route. He was Director of Communication in "flying the hump" from India to China and on the Berlin Airlift. There were other priority and top assignments. He was decorated by Chiang Kai Shek, King George and others. While he was a hard 'taskmaster' and a man of action during WW2, he was also democratic and compassionate to those who worked for and with him. We were honored to have had him serve in the Society as our Vice President. He was a radioman's "Radio Man -- A friend and a real Gentleman. "You have a legion of friends who will always remember you "Pete" MYRIP. Bill Breniman



LEARNING THE CODE ON CORREGIDOR

By- Lester A. Wolff 3997-P

The year 1938 found me on Ft. Drum, commonly called the "Rock", or the "Concrete Battleship". It was located a few miles from Corregidor. At that time, options were limited for an unskilled young man, and I thought that I might make a career out of the army.

I soon grew very bored with the deadly routine, and wished that I was back "home" again. When a notice came up on the bulletin board for candidates to take radio school or electrical, I was the first on the list - for electrical school. Out of the half dozen or so of us who put up our names, only the two of us who put in for electrical school passed the IQ test. So much for the intelligence of aspiring radio operators! Ft. Drum did require a radio operator, so the two of us were switched over to take morse code.

I very soon decided that I didn't like the dits and dahs. I talked to our First Sergeant and asked to be taken out of school. He said, "Les, if you want to get along with me, you will stay the course". With his authority behind him, and the look on his face, I thought that it would be better to give it another shot. I remember one time slamming my pencil into the desk and breaking it into a dozen pieces. Our instructor tapped me on the shoulder, and with a smile simply handed me another pencil.

Back to the "Rock" we went as hot shot operators. Our concrete prison began to get on my nerves, and I suggested to my buddy that I might transfer off, while I still had the chance. My good old buddy pulled it on me first, and I was left as the sole operator of station WVDD. My job was limited to a daily schedule with WVDM (Corregidor), and, during gunnery practice with the harbor boats pulling targets. It was "go out 1,000 yards - come in 1,000 yards and such like". My usual routine was to sweep out the place and settle down with a paper novel to spend the rest of the day. In the meantime my salary had been upped from \$21. to \$62. with gunnery pay. One hundred and twenty-four pesos - big deal.

With the war in Europe heating up, a lot of the old rules were changed. No longer was it possible to put in two years overseas and get a "short discharge". I put in for an extension to complete my service there in the Philippines. For this one time, the old Army paperwork was to my advantage, and I was safely back in San Francisco before the papers came through. The next, and last, transport took only dependants and civilians.

After my discharge from the Army, a friend of mine suggested that I try for a commercial license and go to sea as an operator. After "Pearl Harbor" I bought one of the old "blue book Q & A's". I quit my job and took a flash course in radio theory and a brush up on code. This was much to the disgust of my Aunt and Uncle, with whom I was living with at the time. They felt that it was wrong to give up the first good job that I had ever had. I studied (memorized) around the clock. Many times I would wake up at night with my bed-lamp on and my book laying across my chest

Four weeks later I felt that I was ready to go for my first license. I remember the FCC Inspector telling me, "This doesn't mean that you are an operator. It only means that you are smart enough to learn to be one."



"LES" WOLFF KEYS WVDD

FORT DRUMM



THE "CONCRETE BATTLESHIP"

Next to get my papers and get to sea.

I showed up at the Customs Building in San Pedro, only to find a line that stretched around the place. I sat down at the end of the line, when the man next to me told me to turn in my papers first and return to the end of the line. He said that it would be a day or two before I would reach the front of the line, and then two or three weeks before I would get my final papers. No sooner did I get back to my proper place, when someone called, "Mr. Wolff, please come with me" At our first stop he cut into the line and said, "I have a Radio OFFICER here"!

From then on, it was clear sailing. In one room, filled with naked bodies, my guide repeated that he had a RADIO OFFICER. All of the bodies were quickly pushed back out into the hall, while I dropped my pants for a quick look fore and aft and was pronounced fit for action.

The security arrangements went just as fast. The next morning I had all of my necessary IDs and registered with the local Radio Operator's Union. Before I got back home to Long Beach, my Aunt let me know that the Union had called, and I was to call them back immediately.

Fortunately, the old operator stayed around long enough for me to know how to turn on the set and gave me a few pointers "Gott Sie Dank".

We left San Pedro about sundown. First came a lot of bells, whistles and horns. When I asked what that was for, they told me that it was for the black-out. They had to show me how to fit the black-out screens into the ports and drop the canvas covers over the doors. By the time I had gotten things settled down and went to take a last look at shore, all I could see was a thin wake behind us on a dark moonless night. All I could think of was, "My God, Les, what did you do now"!

When you are young it is easy to adjust to almost everything, and I very soon did. First it was trips to Honolulu, then Espiritus Santas and then behind every one of our invasions, carrying aviation gas. First it was out of San Pedro, and later from the island of Aruba. I don't remember my first station call letters, but our secret call was KS3EP. This was the one we were supposed to keep in our head and never put on paper.

Well the war ended, and so must my letter. I enjoyed my experiences and had intended to remain at sea. I do remember saying that I would never get married and that I would never carry a dinner bucket. Well anyway, shipping was slow in the early fifties and all of my buddies were out at sea, so I ended up by getting myself hitched. About a year or so later my XYL was happily packing my lunch bucket.



VIEW FROM "CROWSNEST"



STRANGE KISMET

Arnold R. Gilmore



This article was submitted to the RADIO OFFICERS' NEWS in February 27th, 1947, by RALPH D. FINCH/758-P
Submitted by Arnold R. Gilmore - 2776-V

Strange are the ways of the sea; stranger yet, the stories of the ships and the men that sail them. This story concerns the untimely end of the SS ALDER - a strange tale, unique in all the annals of the sea.

Let us turn back to the year 1911 when we find the SS ALDER plying a course through the waters of the Persian Gulf on a scorching day with little wind, not uncommon in that part of the world.

Pacing the bridge, the mate became aware of what he thought was a black cloud on the horizon, barely visible. As the minutes passed the cloud grew in size, seemingly headed directly for the ALDER. The mate was puzzled. "Is this a storm approaching?" he thought. He checked the barometer but found no change. The wind direction was such that the storm, if it was one, should be moving away instead of toward the ship. "Very queer!" he said to himself; "I'd better call the old man."

When the skipper reached the bridge he ordered a ninety-degree change of course, but as the vessel moved off on its new course the cloud, now very large, also seemed to change its direction, AND IT WAS STILL HEADING FOR THE SS ALDER. Again and again the ALDER steered new courses, but each time the cloud also changed course as it approached nearer and nearer. Now the entire crew was on deck and speculation was rife. All hands, hardened seamen though they were, were dumfounded. No one - not even the veterans of many years at sea - had ever encountered such a phenomenon.

Soon the immense cloud was upon the ship. Then and only then did the truth become evident. The cloud, believe it or not, was a huge swarm of BUTTERFLIES: millions of weary insects, undoubtedly blown out to sea by some distant storm, were now frantically searching for a place to rest their weary wings, and --you guessed it-- the SS ALDER was to be their haven. Down upon the ship they lit - on the rigging, on the gear, on every available space, butterfly upon butterfly. As tons upon tons of butterflies blanketed the vessel from bow to stern, the SS ALDER, already heavily loaded as was the greedy custom of those days, began to slide lower and lower into the water. Realizing that his ship would soon founder, the captain ordered crew to abandon ship. The lifeboats were launched in the nick of time but not without great human exertion to free them of the winged insects.

In a matter of minutes the SS ALDER slipped beneath the waves, gone forever. However, before the sea had completely engulfed the hapless ship, the great swarm of butterflies arose from her and soon disappeared beyond the horizon.

When one of the lifeboats returned to the scene, little was left of the ill-fated ALDER beyond a small amount of debris and hundreds of dead butterflies. A strange fate for a gallant ship!

In the offices of Lloyd's of London, the famous insurance firm, hangs a plaque upon which is mounted a large butterfly. Inscribed underneath are these words:

IN MEMORY OF THE SS ALDER

45 Fenelon Road
Framingham, MA 01701
February 5, 1981.



"Lee de Forest Speaking"

By RAY S. SUTCLIFFE

Dear Bill:

SOWP and the Society's publications attract me very much. I would not miss them.

The article on the Fall River Line was especially interesting since, in my youth, I worked on some of those boats (Priscilla, Plymouth, Providence, New Hampshire, City of Lowell, Chester W. Chapin and one of the freighters). My first job was in the dining facilities and later, when I obtained a commercial license, as wireless operator. In my spare time, before being licensed, I spent hours on end in the wireless room.

Enclosed is also a picture of the operator at that time (picture taken in 1916). In 64 years I have forgotten his name, but he was very kind to me and helped me.

All this builds up to an anecdote which may be interesting. As you know, the boats sailed at night which left the days free. On this day I am telling about, the operator must have been paid, because he came aboard with one of those double ended "Audions" which had leads coming out of both ends. If the filament burned out at one end, you turned the tube over and used the one at the other end. He didn't need to do that, but he connected the ship's tuner and enough of the auxiliary storage battery supply to provide proper operation.

He handed me a pair of headphones and kept one, of course. We could hear spark transmission from the whole eastern US, north and south, and we enjoyed it.

But after a while we heard a voice saying, "If someone hears this, please reply." So the operator went back (using spark):

"This is KXP, steamer Priscilla" (ship may have been the Plymouth or Providence - not sure).

Voice - "Where are you?"

KXP - "Off Cornfield Lightship in Long Island Sound."

Voice - "How far from New York?"

KXP - "Estimated 100 miles."

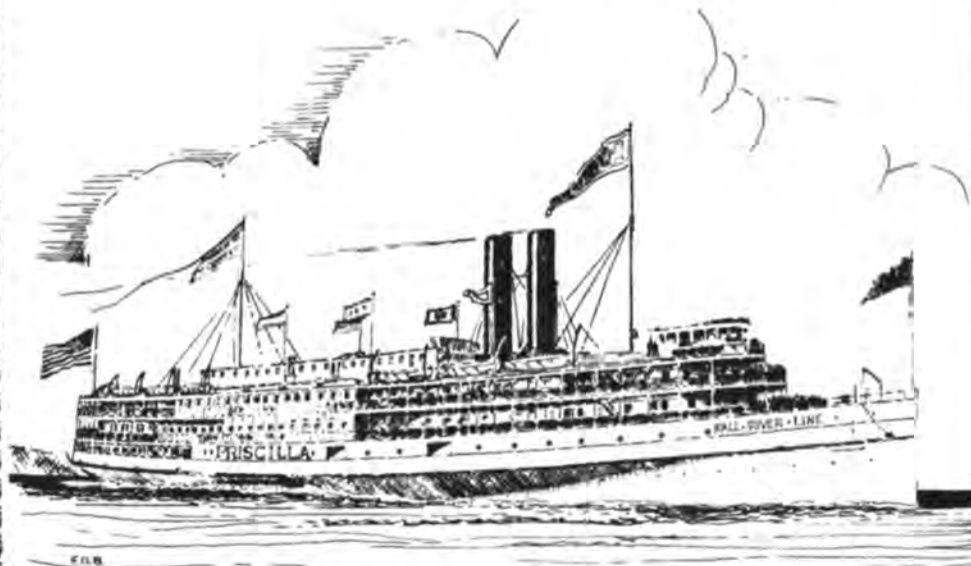
Voice - "Thank you very much. This is Lee DeForest experimenting with voice transmission using vacuum tubes."

As you can imagine, we were thrilled.

73,

R.S. "Ray" Sutcliffe

R.S. "Ray" Sutcliffe
SGP-2925



The Sound steamer PRISCILLA

Built in 1893 at the cost of \$1,500,000 she was queen of the Fall River Line's Long Island Sound run. An institution, she served 44 years. Red plush carpets and other luxuries made her one of the best known and loved overnight boats on the Sound.

The Story of George E. Sterling's Early Years From Wireless 'Ham' to Chief of F.C.C.

From the Collection of Henry Dickow

3-S-SGP SK-1971

George E. Sterling, retired member of the Federal Communications Commission, began his career in wireless telegraphy in 1908 at the age of 14. The present-day call-letters, W1AE-W3DF of his amateur station on Peaks Island, near Portland, Maine, are known world-wide. The trials and tribulations of the wireless experimenter of sixty years ago are related in his personal story:

"The wireless bug bit me in 1908 when I was in the 9th grade of grammar school. I spied one of my classmates reading from a small yellow-covered book concealed in his history volume. It attracted my attention. I passed a note to him inquiring as to what he was reading. His reply was only: "You should read this." At the end of the school day, I set out after him and discovered that the small book was a catalog issued by Hugo Gernsback of The Electro Importing Co. of New York, the sole supplier of wireless apparatus at that time. This incident occurred in the little town of Springdale, ME, where my folks were then residing.

Reading the wireless catalog was a fascinating experience, and the thought of communicating through space without wires made a tremendous impression on me. The catalog, in addition to containing a thrilling introduction to wireless, contained many pictures of coils, condensers, earphones, and other essentials necessary to establish a wireless sending and receiving station. All of this equipment could be purchased -- if you had the money.

Together with Ray, who owned the catalog, and the minister's son, Deac, who lived next door, and myself a dedicated trio was formed, determined to learn more about wireless. Having no money with which to buy the gadgets listed in the wireless catalog, we proceeded to do what many other experimenters did in those days; we wound our own coils, made condensers from zinc and glass plates, and utilized the necks of glass bottles for insulators for our aerials. On Saturdays we often went into the woods with a hammer and chisel looking for silicon, iron, and other minerals which might serve as rectifiers in our detectors.

Having completed our receiving set, what was there to listen to? We were without knowledge of the location of wireless transmitting stations or what their signals would sound like. We had, of course, never seen a wireless station. Wavelengths and kilocycles were not in our lexicon. The only information we accumulated came from the wireless catalog.

Day in and day out, we continued to adjust and readjust the cat-whisker of our crystal detector hoping to hear something that might sound like a code signal. Finally we heard a sequence of strong crashes. Could these be wireless signals? We appealed to the town's railroad telegrapher when he came off duty one night, asking him to visit our home and listen in. After listening for an hour and adjusting the apparatus over and over again, he announced that the crashes we were hearing were not intelligible signals, but nothing more or less than static!



This picture was taken circa 1951 in the back yard of George Sterling's home in Silver Springs, Md., as Joe H. McKinney (at left) was visiting George and looking over a new antenna unit. "Mac", SOWP Member No. 237-SGP was Chief in Charge of the Radio Intelligence Division, FCC., at the time. He was well known from assignments at Dallas, Miami and as Pacific Marine Supervisor in 1957, headquartered at San Pedro, Calif. He was also Vice President [Finance & Audits] for SOWP in the early 1970's. "Mac" sent an SOS from the Steamer Marne/KEDJ in 1921.



GEORGE E. STERLING

Commissioner Federal Communications Commission 1949 - 1954. The above picture was taken of Commissioner Sterling Dec. 14 1951 in Washington. George became an early member of the Society [SGP-438] joining in 1970. In the web of communications, George's life has criss-crossed every mode of the art. Starting in 1908 as a fledgling amateur with call "GS" he became a Marine Radio Operator 1917 assigned to the SS Princess Anne/KOB. This was followed until 1922 with assignments on the SS Philadelphia, Lake Medford, Lake Treba and the Conehatta. He went ashore in 1922 to become MRI for RCA in the Port of Baltimore. Later he became U.S. Radio Inspector in District 3 (Baltimore) Bureau of Navigation, DOC. Later he became Assistant Chief Field Division, Federal Radio Commission, DOC, then Chief Radio Intelligence Division where he served during WW-2 years as Chief Intelligence Division FCC. He was appointed as a FCC Commissioner by President Truman in July 1949 and retired 1954. During this period he represented the U.S. Government at International Conferences [Picao] ANF London 1946; Chaired U.S. Delegation to Havana 1946; Co-chaired at Mexico City 1948. He authored the well known text book "Sterling's Manual" used in many schools and by the army of those seeking information and knowledge of radio-telegraphy. Over 150,000 copies were sold in these early days and the book went into 3 reprints. He also served in the 103rd Inf. and U.S. Signal corps, some overseas. George has been a real friend of the Radio Operator through the years. He is a "Man of Integrity". Still quite spry despite the weight of years, he spends his summers at Peake's Island near Portland Maine and winters at Sarasota, Florida. We are happy to publish the story of George Sterling's early days as written by Henry Dickow more than ten years ago. Henry Dickow, who was SOWP member 3-S-SGP became a Silent Key April 17 1971.

William A. Breniman - Editor

Soon thereafter came the great day. My pal Ray announced he had picked up a definite sequence and concluded it was a wireless signal. We then proceeded to memorize the code. I recollect that when I saw a billboard or the headlines of a newspaper, I would read these in terms of dots and dashes. By this simple method I gained my first knowledge of the wireless code.

The following night I carefully tuned over the entire range of my home-made gear, adjusted the condenser by sliding a set of zinc plates in grooves between a set of fixed plates mounted on a home-made wooden contraption, selecting first one tap on the tuning coil and then another, and - suddenly - well above the crashes of static, I heard the well-defined signal of a wireless station. It was one of the greatest thrills of my life. Night after night I listened in, jotting down a few letters at a time, and later complete words followed by broken sentences. It was the Navy station at Kittary, Maine, 60 miles away, call letters AB.

Geo.Sterling Story - Dickow (Continued from Page 30)

Thereafter the three of us would spend Friday nights together, discussing wireless and building new gear, all through the night we searched for signals from distant stations. We heard some signals from time to time but we were unable to identify them because of our lack of knowledge of the code. Then we concluded the only way in which we could learn the code, was to make our own sending apparatus and communicate with each other. After much time and effort, we succeeded. We even made our own batteries from copper and zinc elements donated by a friendly Western Union telegraph station nearby.

From the proceeds of my newspaper route around town, I was able to save enough money to buy a 1/2 inch spark coil - and what a honey it was! I will forever remember the first wireless call I made to Ray, and his slow-sending reply when he answered with my call-letters GS and signing his own, RH.

Since Deac, the minister's son, lived next door, he and I decided we could use the same antenna which was supported at one end by a huge maple tree in my yard and by a large elm in his yard. What would we do for the wire needed for an aerial? One Saturday we explored the neighborhood and found a long length of telephone wire, a twisted pair, running to an abandoned gravel pit. We "borrowed" it. Believing that the wire had to be bare to serve as an aerial, we coiled it up and placed it in the furnace of the parsonage to remove the insulation. By the time the insulation was well afire, the black, acrid smoke smelling of rubber and tar filled the basement and seeped up through the hot-air pipes into the rooms of the parsonage and in particular into Deac's father's study where he was preparing the Sunday sermon. The story soon spread all over town, and we never did hear the end of it.

With determined practice we soon mastered the code and enjoyed many a rag chew. Then came DX (long distance). My pal Ray proudly proclaimed that he had exchanged signals with another amateur in a town two-and-a-half miles away. Prior to this time we were able to communicate over a distance of only one mile, between Ray's house and my own. The following night I worked CS, Charlie Spinney, in Sanford, Maine. We all used our initials for call letters, and mine were GS. This contact represented the first and longest DX with a 1/2-inch spark coil.

Spinney was Chief Electrical Engineer of a large manufacturing company. He was more ingenious and qualified than the rest of us. From his amateur station I heard my first radiotelephone signals. Spinney built an arc transmitter utilizing the carbons from an arc light; it emitted a continuous wave. One of the by-products of an arc transmitter is the emission of spurious radiation known as "mush". We could not, without a chopper, read the continuous-wave signals from CS when he used the arc, but during his experiments he modulated the wireless signal with music from a phonograph record. Thus for the first time, in 1915, I faintly heard music on my crystal set, accompanied by the heavy mush of the arc. The big thrill came when Spinney called me by voice - my first introduction to amateur radio telephony.

A few years later I copied the list of survivors of the "unsinkable" Titanic which rammed an iceberg on her maiden voyage to New York in 1912. The list of survivors was sent out by the Carpathia, which had more than 700 rescued souls aboard.

I likewise recall the experiments conducted by the Navy with Dr. Fessenden's station at Brant Rock. Each day, the call letters BO were transmitted repeatedly to two Navy cruisers on a voyage to Africa. An attempt was being made to keep in touch with these ships throughout the entire voyage. Dr. Fessenden had invented a system of wireless telegraphy which gave the emitted signal a very high pitch or tone which was more clearly distinguishable and readable through static interference.

There was also a large coastal station at Wellfleet, Mass., call letters MCC, that sent press and messages to ships at sea each evening at 10 p.m. I will never forget sitting up in our cold living room during the winter nights, wrapped in a blanket, and sometimes an overcoat in addition, thereto, awaiting the greetings from the big station at Wellfleet which began its transmission with: CQ, CQ, TO ALL SHIPS EQUIPPED WITH MARCONI AND DEBEG APPARATUS AND SUBSCRIBING TO THE MARCONI PRESS SERVICE.

Little did I realize that in time I would be an operator on one of these ships, copying the press reports from Wellfleet.

One of the earliest recollections of my wireless career concerns the visit of my grandmother to our home each winter. As she departed, she gave each of the children a dime. Discussing my wireless career with my father, she said: "That's the kind of thing that drives boys crazy." In the years that followed, I often heard it said that you don't have to be crazy to be a wireless amateur - but it helps a lot.

On August 13, 1912, a new Radio Act was passed and it went into effect in December of that year. Licensing of amateur wireless stations was made mandatory under this Act. I received notice from the radio inspector in Boston, Harry Gawler, to appear at the Custom House in Portland, Maine, and take an examination. I passed the test and became one of the first four licensed wireless amateurs in Maine. The call-letters 1AE were assigned me, and I have retained this call through all the intervening years.

[Concluded at bottom next column right]

SINKING OF THE LAKONIA

By- Wm. R. Jenkins 4113



Picture of the Cruise Liner SS LAKONIA as fire continued to ravage ship and rescues being made. Taken by member Wm R. Jenkins from HMS Centaur flight deck 26 Dec. 1963.

The British Aircraft Carrier HMS CENTAUR (GKYG) departed UK on 18 December 1963 for deployment, within the NATO umbrella, in the Mediterranean Sea. Enroute just South of the Bay of Biscay (21/22 Dec) I was on duty in the Bridge Wireless Office covering 500khz distress frequency, which is covered 24 hours a day, when I intercepted an SOS from the Greek liner SS LAKONIA enroute for a Christmas cruise. She was in the Canary Isles vicinity with a severe fire on board which was spreading very rapidly throughout the vessel. The ship was eventually abandoned in a somewhat disorderly manner (survivors later complaining of No drills, and panic by crew members). The fire had started in the Galley and spread via the fan trunking to the rest of the vessel, and according to later reports the fire fighting facilities left a lot to be desired.

The "Sparks" (along with the Senior Officers) was amongst the last to leave the stricken vessel after having ensured that support vessels were on their way.

About 8 vessels attended the unfortunate ship within hours of the initial SOS. These ships being of various nationalities (including 1 USSR Merchantman) and not able to fight the fire were thus employed in rescue tactics whilst we undertook the duty of Rescue Co-ordinator controlling the scene from afar whilst deploying from our original course to the area affected, setting up an MF frequency to control events.

We arrived on the scene on Christmas Eve and joined the rescue operations ourselves albeit for collecting and picking up bodies of the unfortunate victims from the murky waters. We ended up with approximately 60 bodies stored in our refrigeration room, with the Sailmaker permanently "Rummed" up for his gruesome task of encasing the bodies in sailcloth.

I was one of the many wireless operators employed in longboats recovering the bodies from the water and operating a portable transceiver (Type 634).

The survivors were taken by the other vessels to ports mainly on the East coast of Africa. We left the scene on the 29/30th December 1963, leaving the LAKONIA in the hands of 2 Deep Sea towing tugs for the tow to Gibraltar. We were later informed that after several breaks in the tow, the LAKONIA finally sank in rough seas approximately 2 days out from Gibraltar. The bodies on board CENTAUR were landed and buried on the rock.

I must point out that the Radio Operators involved both Military and Commercial, showed extreme values of co-operation and a very, very high standard of professionalism throughout the entire period covered.

In the fall of 1916, I went to sea as a commercial wireless operator. When war came in 1917, a group of Boy Scouts in uniform came to my home and lowered my wireless antenna, which was then suspended between 65-ft. poles which I cut and trimmed myself. All amateur wireless stations were shut down for the duration of the war, and the Boy Scouts did their part to enforce the rule."



The History of Press Wireless Inc.

BY DONALD K. DE NEUF

HISTORICAL PAPER

During the 1914-1918 World War, and for some time thereafter, international telecommunication facilities were completely inadequate to accommodate the rapid transmission of news dispatches. More activities of one kind or another were taking place than ever before in history. News dispatches often suffered extensive delay in transmission with the result that the public was deprived of prompt information on current events. Overseas business traffic, because of its nature, often afforded some leeway in transmission speed because of the time difference. Usually no one wanted a business message delivered to an office at three in the morning. But in the field of press traffic, especially for agencies serving subscribers on a global basis, there existed "a deadline every minute of the day."

A concerned group of publishers in 1920 organized the American Publisher's Committee on Cable and Radio Communications, and after a year's investigation, decided to go into the communications business. A traffic agreement was made first with the British Post Office, which agreed to place a longwave wireless transmitter at the disposal of press interests. The Committee opened up a radio station in Halifax, Nova Scotia, to receive the London signals. Halifax was chosen because of its superior technical location for longwave reception, plus the fact that the problems of U. S. Patents, which were held chiefly by the large communications companies, prevented the APC from purchasing many types of equipment in the States.

Traffic received at Halifax had to be turned over to a landline telegraph company there for sending on to US addresses. This frequently entailed some delay and the cost was comparatively high. The APC group discussed radio station licenses with the Federal Radio Commission. As a result in 1929 Press Wireless, Inc., was formed by a group of newspapers and was licensed by the FRC to operate on a number of "short wave" frequencies for the handling of press material.

PW's first station WJK was set up in Needham, Mass., in 1930, and was used to communicate with Halifax. Longwave receiving facilities were installed to intercept the London transmissions. When a message was received, Halifax was notified by WJK. This not only speeded up traffic movement but saved the landline telegraph tolls from Halifax to the US addressee.

From this point on Press Wireless began to expand its facilities, often importing foreign-made tubes to circumvent the US patent restrictions. Stations were constructed at Little Neck and Hicksville on Long Island, and at San Francisco and Honolulu in 1932.

At this time successful negotiations were carried out in Paris with the French Ministry of Posts and Telegraphs for a heretofore unheard of arrangement for PW to lease PTT transmitters and receivers at Paris, and for PW to conduct operations from its own office. Press message service through the new facility proved to be excellent, and soon many American newspapers and news services centralized their dispatches at Paris from other European cities in order to use the new PW communications service.

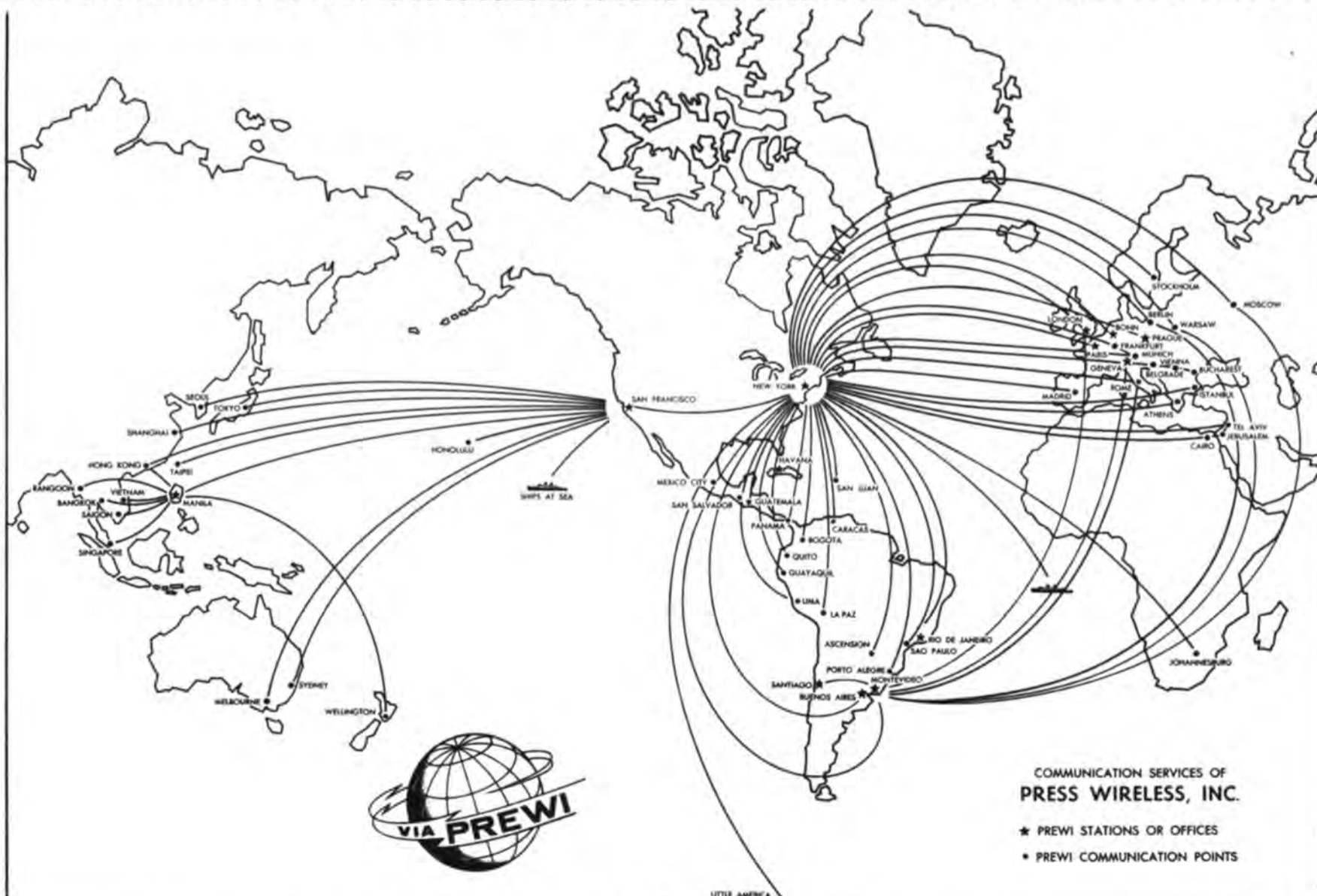
As the company grew, it assembled a staff of engineers and operating experts who were tops in their fields, many of them being avid radio "hams". The company's circuits began to girdle the globe (see map, Figure 1) and it soon found itself serving news agencies such as The Associate Press, The United Press, Agence France Press (French), Reuters (British), ANSA (Italian), DPA (German) and others. It supplied the US Information Service with transmission services to various embassies abroad.

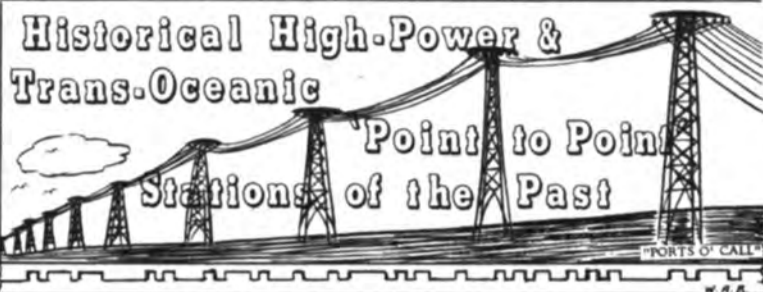
PW was often the first to develop and apply new improved tele-communications methods, such as the frequency-shift techniques for both radioteletype and radiophoto-facsimile, and the "Duo-Plex" system of keying which doubled the number of teleprinter channels over a single transmission circuit. The company manufactured all of its own high frequency transmitters with powers up to 50,000 watts, and its "PW Model C" fixed frequency receivers were used throughout the world in the reception of the company's "multiple-point" presscasts and photocasts by news agencies.

It served 62 different countries, and carried more than 450 million words of textual material, 36,000 radiophotos and 83,000 minutes of voice programs during the course of a year. It operated some forty-seven HF transmitters at Centereach Long Island, and ten at Belmont in California. Its 500 acre transmitting antenna farm at Centereach

(Continued on Page 33)

PRESS WIRELESS - TWENTIETH CENTURY MERCURY





VIA PREWI



During World War 2, PW made history with its mobile press units. One (PX) was ferried ashore at Omaha Beach in Normandy and accompanied the invasion forces all the way to Berlin. The other (PZ) accompanied the invasion of the Philippines. During this time extensive voice broadcasts facilities were provided by PW to the OWI (Office Of War Information). The company's manufacturing facilities were completely converted to producing transmitters and other gear for the military forces. The Secretary of War conferred upon the company the Army-Navy Production "E" Award three times for outstanding achievement in producing communications equipment.

(Continued from Page 32)

accommodated over 70 antennae of various directional and omni-directional types. Extensive diversity type receiving stations were operated on Long Island and in California. (See Figure 2-3-4).

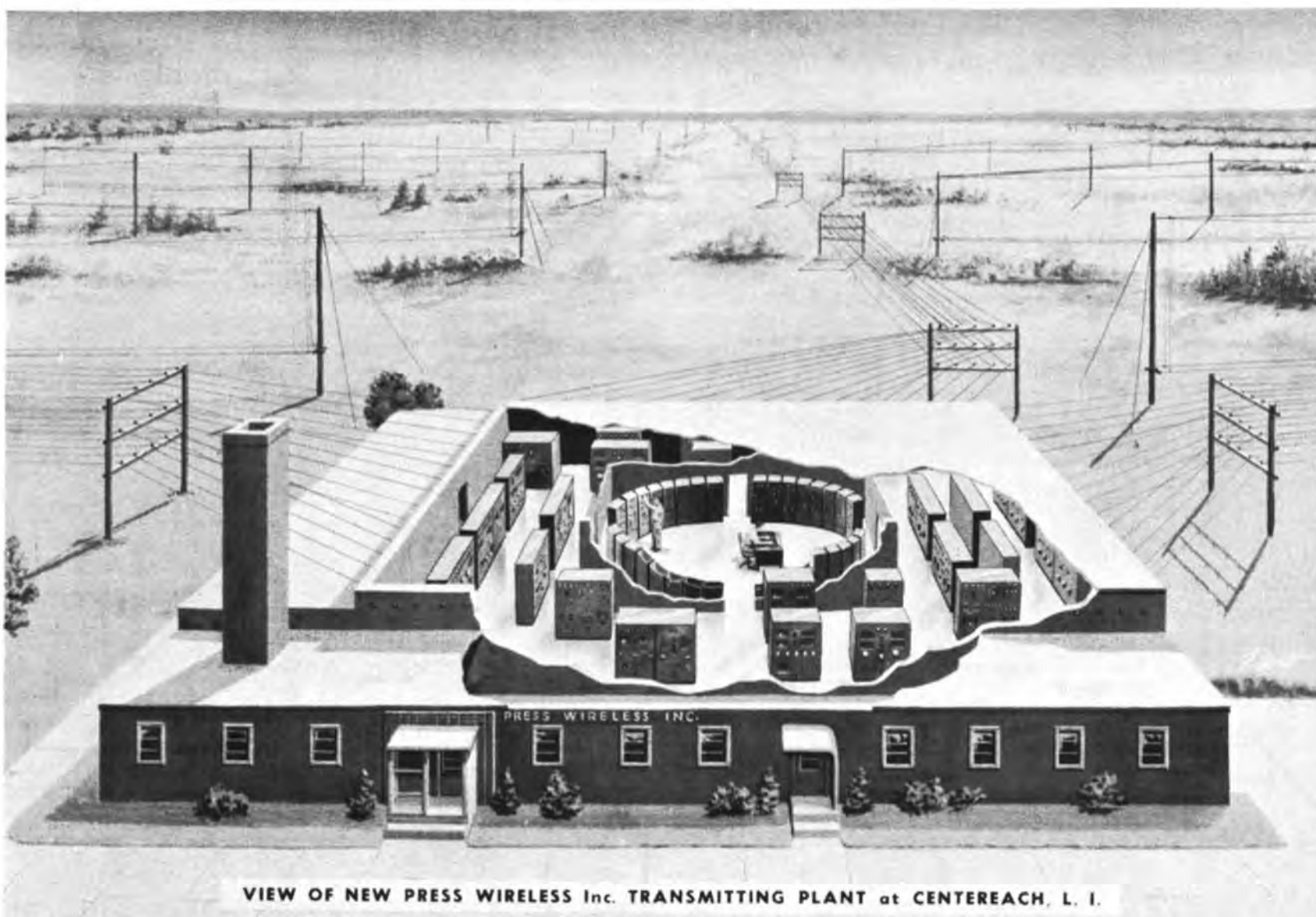
For the first time in history millions of people in one part of the world were quickly informed of news events taking place in other parts of the globe via newspapers, broadcasting stations and even bulletin boards fed by PW signals. Although its primary services were for the press and broadcasters, it provided several others. Few transAtlantic airline travelers knew that the radio voices between pilots and ground based controllers passed through PW facilities. The company provided all of the HF transmission and receiving ground facilities for Aeronautical Radio, Inc., which served all airlines entering and leaving the US with Communications.

Based on competitive tests, the US Weather Bureau awarded PW all of its HF meteorological facsilite map transmission service from Washington to European and Pacific points. PW provided all the leased duplex teleprinter channels for the United Nations between its offices in New York, Geneva, and Leopoldville. The U. S. State Department's private leased duplex 24 hour teleprinter channel between Washington and Montevideo was provided by PW for many years using the facilities of the company's subsidiary stations in Uruguay. The State Department's monthly service records shows an average of 97% efficiency for the circuit - the highest of all those it operated around the world.

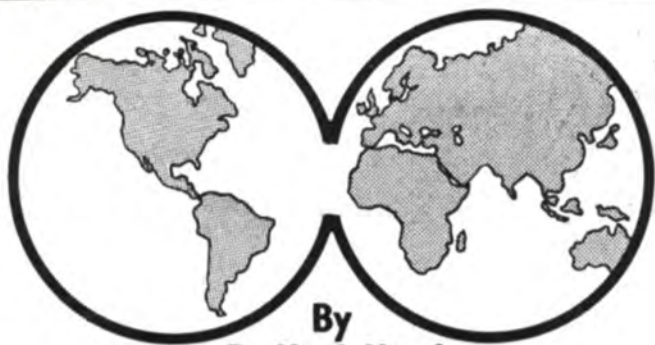
Two of the company's unique California transmitting and receiving facilities were those provided for the Japanese and Chinese press. These accommodated the two ideographic languages by means of facsimile systems since conventional teleprinter keyboards of course could not be utilized for handling the complicated characters involved.

Direct HF circuits between Moscow and New York, because the E-W

(Continued on Page 34)



VIEW OF NEW PRESS WIRELESS Inc. TRANSMITTING PLANT at CENTEREACH, L. I.



By
D. K. deNeuf

(Continued from Page 33)

paths ran so close to the North Pole, were often seriously affected from a propagation standpoint. PW developed two very effective alternate routes using automatic repeaters—one via its California station and the Soviet Station in Khabarovsk, Siberia. These were the only circuits of their kind.

PW had its share of challenges and usually met them successfully. One example was at the time of the "Cuban Missile Crisis" in 1962. On a Friday night the Director of Communications at the United Nations called PW with a request which he admitted was next to impossible to fill. He had to have a complete UN radio teleprinter station ready to air ship to Cuba the following Monday morning. Not only a transmitter, receivers, terminal gear and gas engine power supplies had to be assembled, but complete antenna systems - supports, guys, insulators - everything - teleprinters complete with a supply of paper, ribbons and spare parts! PW had the equipment ready and delivered to the UN headquarters in New York City Monday morning as requested. It was this "can do" philosophy which endeared PW to its users.

By 1964, a dramatic change began to appear in the telecommunications field with the development and implementation of wide-band under-seas coaxial cables and geostationary satellites in space. Each year literally hundreds of additional high quality voice-grade channels began to be available to meet the worldwide information explosion and the new age of computers and data processing. HF radio facilities began to be replaced with these new systems. The communications cost to users requiring full-time leased channels from the common carriers between virtually any two or more points on the globe began to drop sharply. In 1965, Press Wireless was acquired by ITT World Communications. The facilities and services of PW soon began to be combined with and integrated into those of ITTWC.

[30]

PICTURES - RIGHT - Taken in Operations of Press Wireless Inc., at Times Square Bldg., in New York circa 1944.
TOP: Receiving end of circuit connecting to ... "Somewhere in France" Operator Herbert Gott, standing (Now SK), Jim Green sitting.
BOTTOM: MOSCOW WIRE with about 20 handling circuit. Tape often ran 800WPM with 300,000 words daily. Supt. left of clock with phones on John H. Asher W2NXB. Pictures from collection Donald K. deNeuf



PART OF CENTEREACH DISTRIBUTION SYSTEM SUPPLYING MORE THAN 70 SEPARATE ANTENNAE.

Press Wireless—Twentieth Century Mercury

By A. WYN WILLIAMS

MARCH 15, 1945

(Continued from Page 34)

It brings you "on the spot" war news—almost as soon as it happens

IN World War I it often took two or three days for war correspondents to send stories back home about the activities of American boys on the battlefield. Occasionally the stories never got through at all. They were suffocated by an accumulation of commercial messages to which the cable companies gave priority because they paid higher rates. Even in peacetime there had been exasperating difficulties in getting foreign news through promptly.

NEWS WHILE IT'S HOT

Shortly after the war, however, the newspaper publishers of this country decided that the American public was entitled to as efficient service in the receipt of foreign news as it had been taught to expect in the case of domestic news. Out of this decision was eventually born Press Wireless, or "Prewi," as it's affectionately called in the trade. The result? Today, the news editor of any paper published in any medium-sized city gets the detailed story of a battle in France or Belgium quicker than he can get the full report on a five-alarm fire in the suburbs of his own city.

It takes little more than a quarter of an hour, from the time a correspondent files a message at the mobile sending unit of Press Wireless, for it to reach the company's offices in Times Square, New York, whence it is despatched with the speed of electronics to his editor's desk in practically any part of the U. S. It's the first time in the ageless history of warfare that civilians get news red hot from the battlefield at almost the instant it happens; and not only does Press Wireless despatch the news with the utmost speed, it also sends it through without undue condensation. Further, it transmits radio photographs with the same speed as word descriptions, thus providing the public with a front seat at the theater of stirring drama!

So unostentatiously has Press Wireless perfected its revolutionary service, however, that the general public knows little of its background and activities. Yet, in the true American spirit, it has battled monopoly and been a champion of free initiative. Only organized in 1929, with the relatively small capitalization of \$1,000,000, it has never wavered from its objective of removing any obstacles that prevented the American public from receiving for-



War correspondents in France prepare copy for transmission over Press Wireless

foreign news with the speed to which it was entitled. To achieve the same efficiency in transmission of foreign news for the American public as had been done in the case of domestic, two principal obstacles had to be overcome: (1) Cable routes were controlled by what amounted to a monopoly; (2) press charges were prohibitively high. In its short existence, Press Wireless has been able to reduce them by nearly 75%, an incalculable service to democracy, whose chief hope of survival is to be informed.

The monopoly of the cable companies, chiefly owned by Great Britain, was broken by a fortuitous circumstance of which Press Wireless took full advantage. Rapid advances in the art of radio transmission had demonstrated that continents and oceans could be spanned not only by Morse signal but also by the human voice. Radio transmitters would, therefore, make Press Wireless independent of the cable companies. At about the same time the newly-formed Federal Radio Commission recommended that a single public utility be formed to provide "a bona fide public utility service open to all agencies of the American Press on a fair and equitable basis."

RIVALRY PUT UP CAPITAL

Press Wireless is not only a tribute to American enterprise but even more so to the American sense of fair play, even under the most strenuous conditions of competition. The capital was put up by bitter rivals. All the stock is owned by the four big Press Associations of the country: AP, UP, King

Features and NANA, and seven leading newspapers—the New York Times, the New York Herald Tribune, the Chicago Tribune, the Christian Science Monitor, the Chicago Daily News, the San Francisco Chronicle, and the Los Angeles Times.

Yet none of these giants in the news world has claimed any advantage for itself. The charter of Press Wireless stipulates that it must sell its services to any and all, without discrimination. Therefore, at any sending station any message goes out strictly according to the time of filing, no matter whether the correspondent is on the payroll of the Socialist Daily Worker, a subscriber, or on that of the Chicago Tribune, a stockholder, with far different ideologies.

By 1937, in eight short years after its organization, Press Wireless had become the largest single handler of press material, although it had as competitors old-established communication companies beside whose gigantic capitalization the \$1,000,000 of Press Wireless was mere chicken feed. Today, it handles more press material than all other radio and cable carriers combined. The 1944 record was approximately 120,000,000 words—the equivalent of six ordinary-sized novels every day; 250,000 square inches of radio photographs and facsimile—enough, daily, to fill two pages of an ordinary newspaper; and 18,000 hours of radio programs—more than is put out daily by two radio stations on 24-hour service.

MANY OBSTACLES OVERCOME

Press Wireless wasn't able to achieve this pre-eminence without a fight. To start with, the established communication companies challenged its legal right to operate. This actually delayed its ability to function until 1931. Then, after winning its battle in the courts, it came up against a more serious threat. It found that firms manufacturing transmission and other equipment had interlocking interests with the communication companies that had been worsted in legal battles. These manufacturers refused to sell apparatus to the infant company, except at prohibitive prices. Under the fighting leadership of the company's first president, Joseph Pierson, a former editor of the Chicago Tribune, the company refused to be daunted. It decided to manufacture its own equipment and set up its own research department.

This spirit of refusing to acknowledge defeat has proved an unexpected boon to the U. S. in her war effort. Experience gained in manufacturing

its own equipment has made the company a leader in a number of engineering developments, all of which have provided better transmission and reception facilities. These are being furnished in ever larger quantities to the armed services and are helping to maintain expert communication on the fighting fronts. For its contribution, the manufacturing branch of the company has received the Army's coveted E award.

The onrush of Hitler's hordes greatly curtailed the company's communication services to Europe. Press Wireless left Paris in May, 1940, when the Germans were but a few miles away, after sending the last direct message from the city that America received until its liberation four years later. It is, therefore, poetic justice that it should have been the first to communicate directly with America from France after the liberation forces had landed in Normandy. It had its 400-watt set working on June 13, D-Day plus 7, although experts had not expected such an eventuality for at least six weeks.

Behind the setting up of Press Wireless facilities in Normandy there is again the same story of refusal to accept defeat. Although Press Wireless specialized in transmission of news, and, before the war, had demonstrated its efficiency by establishing an organization that covered the globe, it was refused permission to establish facilities for handling stories of the North African campaign. Another company, however, the Mackay Radio & Telegraph Co., readily received permission. Similarly, Press Wireless was refused permission to establish its facilities in Tunisia and Sicily. The result was a breakdown in the despatching of war news from these theaters.

FRONT LINE SERVICE

But Press Wireless didn't sulk. Once again it had a fight on its hands. Finally, in January, 1944, after a Congressional investigation, it received permission to set up facilities for transmitting news of the European invasion, when and if it occurred. That's how "Prewi" came to land with its 400-watt mobile sending equipment on D-Day plus 4, when the dead were still lying unburied on the Normandy beaches. That is why it has continued, since D-Day plus 7, to send back news of the fighting at the rate of 400 words a minute—within less than 20 minutes of the correspondent filing his message. Sometimes it sends as many as 90,000 words a day. And its mobile units follow right on the heels of advancing troops to give red hot news of battle action.

Today, Press Wireless can feel flattered that rival companies, which once tried to throttle its existence, are now following its lead by also employing mobile units. But "Prewi" showed the way to service.

Donald K. deNeuf

CREDIT LINE

The foregoing appeared in Forbes Magazine 3-15-1945 and was furnished by SOWP Member Donald K. deNeuf [Charter 117-SGP], from his collection. Mr. deNeuf retired on 11-1-71 from the Presidency of Prewi. Since retirement he has authored many 'Historical Papers' on early day communications. His ability in this field can best be summed up by the following from VP & Gen.Mgr. UPI as follows: ... "There has been a 'Non-UPI' individual who contributed more in the way of telecommunications expertise and general assistance with our world-wide problems than you". Equally laudatory comments were furnished by AP. Don received his "Pink-Ticket (#4) Feb. 1 1927. He has served on many 'name ships' in the MM field; also PtP HI-Pwr. We thank him for these excellent reports of historical interest. WAB



This "Prewi" station is located near MacArthur's former headquarters on Leyte

Book Review by Cdr.E.J. Quinby SK.11-8-1981



"AIMEE"

Saga of a Radioman



K. G. ORMISTON

BOOK REVIEW

Radio Doings

February 26

LEAST OF ALL SAINTS: The Story of Aimee Semple McPherson, by Robert Bahr, with two dozen historic photos. Published 1979 by Prentice-Hall, Inc., Englewood Cliffs, NJ 07632

I wish I had written this incredible book. I would surely have entitled it SAGA OF A RADIOMAN. Tightly packed with fascinating, preposterous, thrilling mysteries and sprinkled with side-splitting comedy, it follows the life story of one of the world's most popular, most beautiful, most successful and most notorious evangelists.

Starting with a road show playing whistle-stops in a shabby, leaky tent, Aimee was promoted and managed by her capable Irish mother, Minnie Kennedy, to achieve national fame. The 10,000 faithful who were attracted to her revival meeting in San Diego's Organ Pavilion in Balboa Park proved too much for the city's police department to handle, so the U.S. Marines were hastily called out from the Naval Station. Thanks to Ma Kennedy's efficient organizing, the collection plates overflowed with sufficient funds to start construction on the 5000 seat concrete and steel Angelus Temple in Hollywood, with a mammoth free-standing dome bigger than any other in the nation, even St. John's Cathedral in New York. When completed, its three shows a day were inadequate to accommodate the long lines of Aimee's enthusiasts who queued up to get in and enjoy her preaching, augmented by the big Kimball theatre organ, the symphony orchestra and her 100-voice choir. To reach the countless legions afield who couldn't be present, it was Kenneth Gladstone Ormiston who prevailed upon the popular Aimee to let him build a powerful radio broadcast station with antenna mast atop the great dome. Minnie Kennedy didn't altogether approve of the tall, dark and handsome Radioman whose World War I hip injury made him limp, but her daughter over-ruled her objections to the expense, and went along with the project despite its cost.

Radioman Ormiston took care of the public address system of this vast edifice, and took care of running its broadcast station KFSG (Kalling Four Square Gospel) to blanket North America's west coast way up into Canada. And Ken evidently took care of other matters for the charming, affluent Aimee when she decided to take a sabbatical and see for herself the Holy Land described in her Bible. During her extended absence it was discovered by the nosy, newsy reporters that Radioman Ormiston was also absent from the temple scene. Warned by a cablegram from friends that the press was on his trail, Kenneth hastily left the hideaway in a posh Rome hotel and turned up in Seattle, whence he phoned Aimee's mother to report that KFSG was coming in loud and clear up there in the Pacific Northwest, thus squelching some unsavory rumors concerning his whereabouts. Presently, Aimee rejoined the anxious Ma Kennedy and resumed activities at the Angelus Temple.

Having tasted a bit of worldly recreation, Aimee soon became bored with the endless routine of life at the temple, and staged a baffling mysterious disappearance. Last seen bathing in the surf at Ocean Park near Los Angeles, she was assumed to have drowned, which precipitated front-page headlines across the nation. But the prying news-hounds reported that a couple resembling Aimee and Ken were holed up in a sea-side cottage at Carmel up the coast. The gal had auburn hair like Aimee and the man limped like Kenneth. Both suddenly vanished from the little cottage. Then came the startling threat-note from the "kidnappers", demanding ransom money for Aimee at a time and place to be "later specified." Was the missing Radioman holding her captive for a fat ransom fee? While the nation anxiously awaited the answer, the beautiful heroine blithely tripped out of the Arizona desert in her high-heeled slippers to explain to the authorities that she had been seized at Ocean Park some weeks ago by a couple in a car, who kidnapped her and kept her in a "smelly bag". Her Irish mother became suspicious, but went along with the story to the press. Radioman Ormiston subsequently reappeared, but he was disappointingly uncommunicative, as any gallant Radioman would be under such circumstances. The authorities found themselves perplexingly incapable of forcing him to open up, but QRT became his watchword.

So, how did it all turn out? There's lots more to this engaging story. You'll find it difficult to believe, but apparently it's history. For \$12.95 you can get your money's worth of entertainment concerning how the classic Radioman enjoys life ashore now and then.

Meet Our Friend ¹⁹²⁷

By K. G. ORMISTON

This week we are going to introduce to you a chap who seldom exercises his vocal cords before a "mike," and hence is little known to you. And yet it rests with him whether or not you will derive enjoyment in listening to any radio program. Regardless of how splendid a studio performance may be, it is all useless unless the care and manipulation of the transmitting equipment preserves the quality through all the intricate processes of transmission involved in putting the program "on the air."

You've guessed it. We are using this space in an effort to make you chummy with a young fellow to be found in the operating room of every station. If things are running smoothly you will find him at his desk listening to the outgoing program and carefully controlling the modulation. But if there's a "bug" in the works, the operator will be found hanging on the side of the transmitter cage like his Darwinian ancestor, poking his nose into close proximity with enough volts to knock a man across the River Jordan, frantically trying to make music sound less like static!

As a general rule, he knows his business. In fact, he is the only man around the radio station who knows anything about radio, though he is usually treated by the rest of the staff as a sort of necessary evil. In most cases he is an old-timer, who has grown up with radio, and sailed the seven seas with every type and vintage of wireless equipment. His station is to him as a child of his flesh,—he knows and understands its weak points, its limitations, its peculiarities.

He is forever checking the microphone balance, watching the red-hot plates of the tubes, looking for bright spots in the filaments, keeping an eye on at least a dozen meters, feeling the bearings of the generators, checking the wave-length, watching the charging of the batteries, listening to the output, both in headphones and loudspeaker, and thus doing his level best to send a true and accurate reproduction of the program into your receiving set.

Simultaneously with the few duties mentioned, he carries on numerous telephone conversations with dear old ladies who call up to inquire just how to do about tuning in JOAK on their "Blabdyne" sets!

Very often when the announcer has murmured his final "Good Night," and all the lads and lassies of Radioland are tucked away, our friend, the operator, who has kept his set on the air for the last hour by the skin of his teeth, rolls up his sleeves and pitches in. A neat,

orderly operating room presently resembles No-Man's Land as Big Bertha comes to pieces. The offending coil or condenser is eventually found, repaired or replaced, and the last connection goes back into place just in time to broadcast your morning setting-up exercises!

The one important thing in life for the operator, or engineer (as he likes to be called, and justly so), is to keep his station on the air at all costs. Any failure of his equipment during a program is a calamity of vast proportions, for which he holds himself personally responsible. Incidentally, and unfortunately, the boss takes the same view.

Now we're going to let you in on something. Sometimes the operator day-dreams a bit, forgets to watch the modulation, and permits perfectly good music to go out like so much hash. Listen! We'll tell you what happens when he wears that dumb look and stares unseeing at his panels.

His mind is far from the whirring generators and the dancing needles of his meters. Wanderlust and the call of the briny deep have gripped him. He sniffs the tang of the sea and feels a throbbing deck beneath his feet. With the speed of ether waves, old familiar scenes flash before his mind's eye.

The stench of the Orient—The French Band in its evening concert on the Bund at Shanghai—The fan-tan tables of a famous gambling house on the Bubbling Well Road—The seething inferno of Kilauea's crater.

For a moment he stands in the doorway of an Alaskan wireless shack and watches a June dawn—A fleeting glimpse of No. 9 in Yokohama with its painted faces and gorgeous chrysanthemum blossoms—Cup Day at the Melbourne races—A rosy-cheeked barmaid in Auckland—

The picturesque "junk" fleet of the Yellow Sea—A hula dance 'neath the waving palms of Samoa—And best of all, Mount Tamalpais rising up out of the fog as the pilot comes aboard!

And so, friend reader, you have met the broadcast operator. We hope you will like him and count him as much your friend as the announcers and artists whose names are so familiar to you. When you enjoy a radio program and have a feeling of appreciation for the efforts of those who have brought it to you, don't forget the man behind the switchboard (or more likely under it!). Give him a ring and tell him you like the way he puts out the stuff.

Editorial Comment

While I was never a shipmate with "Ken" Ormiston, I knew him well. He was a frequent customer later at my radio store in Los Angeles, patronizing me for equipment used at Aimee's Temple. He was a very friendly man but considered a "loner". The article below is copy I kept from a weekly magazine called "Radio Doings" (Issue 2-26-27). Member "Jim" McArdle sailed with "Ken" on one of the South Sea ships shown below. Jim (SOWP 292-SGP) sailed all three plus the Yale and Harvard plus five years at KFS. "Jay" Quinby became a silent key 11-8-1981. WAB



S.S. SIERRA
S.S. SONOMA
S.S. VENTURA

10,000 Tons Displacement
each

19 Days to Sydney, Australia

Picture - James J. McArdle



Society of Wireless Pioneers

SOWWP

/ Morse-sleutelaars verenigen zich internationaal

DOOR JAN NOORDEGRAAF

De bekende Vereniging van Kaap-Hoorn Vaarders, nog niet opgeheven, werd in 1937 opgericht ten behoeve van hen die in hun leven minstens éénmaal met een zeilschip om de beruchte Kaap Hoorn hadden gevaren. Het was in principe een uitstervende vereniging. Wellicht zal in de toekomst een nieuwe generatie „echte” zeelieden opstaan, als gebrek aan brandstoffen daartoe aanleiding zal geven.

Men dient echter nooit te vergeten dat de zeilvaart en haar zeelieden aanleiding waren tot moderner vormen van zeevaart met stoom of dieselmotoren. Juist dit besef was aanleiding tot het vormen van bovengenoemde Vereniging, en haar leden zijn er trots op dit tijdperk aan den lijve te hebben meegemaakt.

Een soortgelijke ontwikkeling is de SOWWP, Society of Wireless Pioneers, in 1968 in California, USA, opgericht. Het is thans een vereniging met duizenden leden, die als kwalifikatie hebben dat ze op een of andere wijze de seinsleutel onder de vingers hebben gehad. Maar in tegenstelling tot de Kaap-Hoorn Vaarders, wier tijdperk voorgoed voorbij is, zal het nog wel 15-25 jaar duren vóór het morse-schrift als maritieme communicatietaal grotendeels zal zijn vervangen door spraak of telex. SOWWP loopt duidelijk vóór op deze ontwikkelingen, maar deze gaan zo razend snel dat het noodzakelijk is reeds thans industriële archeologie te bedrijven om een aantal belangrijke feiten voor het nageslacht vast te leggen. Maar er is méér.

De Vereniging, onder leiding van haar oprichter Bill Breniman, heeft statuten die dicht tegen die van de radio-amateurs aanliggen, hoewel SOWWP de professionele radioman op het oog heeft.

Het hoofddoel van de Vereniging is het verzamelen, navorsen en vastleggen van de geschiedenis van de radio-pioniers, en het publiek bekend maken met de verrichtingen en daden van de radiotelegrafisten die in tijden van nood en rampen hun waarde hebben bewezen.

Er zijn duizenden mannen en vrouwen die in het verleden te maken hebben gehad met een of andere professionele vorm van morse, hetzij als maritieme of landtelegrafist, of via de militaire dienst. Velen van hen kennen de SWOP niet, maar zijn in principe gekwalificeerd voor het lidmaatschap. Men moet bona fide kunnen bewijzen ervaring te hebben met het bedienen van boog-, vonk- of buizenzenders, en valt daarbij onder de volgende klasse:

- S-SGP senior spark gap pioneer – senior vonkzender pionier, tot 1915
- SGP spark gap pioneer – vonkzender pionier, 1915-1925
- P pionier – pionier, 1926-1939
- V veteran – veteraan, 1940-1949
- M regular member – lid, na 1950.



RO van een modern containerschip, „Nedloyd Dejima”, achter het marisat terminal

Sparks / oude en nieuwe stijl



SWOP heeft tevens in haar banier geschreven goede relaties tussen haar leden te bevorderen door middel van bijeenkomsten, gebruikmaking van het amateur-radionetwerk, het opzetten, uitbreiden en handhaven van een bibliotheek, en het uitgeven van een aantal publikaties. In de stijl hiervan vindt men de codes van de radio-amateurs terug. „Een radio-amateur is vriendelijk, behulpzaam, patriottisch...” woorden die menig radioman op het lijf geschreven zijn.



Tekening van H. A. Seeboldt

Kapitein tot radio-officier.
„Sparks, zullen we nog eens ruilen?”

Genoemde publikaties zijn:

- Sparks Journal, – met publikaties over de ervaringen van medeleden en artikelen van meer algemene, historische aard.
- Ports O'Call, – periodiek verschijnend mededelingenblad.
- The Wireless Register, – world wide register of members, met alle internationale leden van SWOP erin vermeld (2500).
- het uitgeven van QSL (ontvangst) kaarten, labels, vlaggen, medaillons en andere SWOP-gemerkte materialen.

In de laatste uitgave van The Wireless Register staat vermeld onder Chapter Eternal, dat nummer HON-9, Lord Mountbatten of Burma, Hampshire, Engeland, is afgevoerd. Deze professionele „brass pounder” kwam om in zijn boot door een aanslag van de IRA, zoals bekend.

Ook staat onder „Silent Key” vermeld: nummer 336-SGP, Lester H. Sparks, Long Beach California. Een toepasselijker naam voor een radio-officier kon er niet zijn!



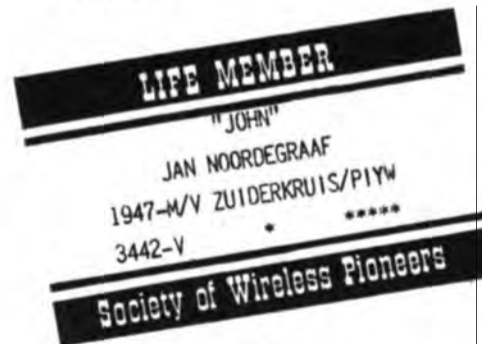
Wanneer, op een zeker ogenblik, de seinsleutel zoals het zeilschip heeft afgedaan, heeft een vereniging als SWOP er het hare toe bijgedragen dat de historie niet verloren is gegaan. Vroegtijdig en konsekvent. Het is zeker waar dat communicatie, radiocommunicatie, mensen dicht bij elkaar brengt. Als de wereld ooit verenigd wordt, zal dat zijn door de invloed van radio, beginnend bij morse, en thans aangeland bij satelliet-communicatie en TV uit de ruimte.

SWOP, de niet-commerciële Vereniging van Radio Pioniers, verheugt zich in een steeds grotere belangstelling, kennelijk voortgedragen door een golf van nostalgie die elders ook voelbaar is, maar vooral in de Verenigde Staten. Een kontributie van \$ 10.- per jaar is dan ook een stimulans voor die groei en met de recente lage koersverhoudingen, begint SWOP steeds meer leden buiten de Verenigde Staten te krijgen. Ook het gemakkelijker reizen draagt daartoe bij. In Europa is het aantal Zwitserse en Duitse leden merkwaardig groot ten opzichte van andere landen. Te verwachten valt, dat het aantal leden zich zal uitbreiden naarmate het transistor- en IC-tijdperk voortschrijdt, totdat er een stadium is bereikt waarin de Kaap-Hoorn Vaarders thans allang terecht gekomen zijn.

SOWP— Reprint from Dutch Journal



RO van het ss „Olympic”, anno 1913, zuster van de gedoemde „Titanic”



IN APPRECIATION . . .

We are reprinting the foregoing write-up which appeared earlier this year in the Dutch Nautical Magazine -- De Blauwe Winpel-- probably the most outstanding and best known Nautical publication in Europe.

Jan Noordegraaf, Author is also the Editor of De Blauwe Winpel. He has authored about ten Maritime books, the last being ... "In the Wake of Marconi". They are all in Dutch language. He is also co-editor of 3 Dutch maritime periodicals. "John" QTH is 52 Vliek, 2036 CN Haarlem, Netherlands. (SOWP - 3442-V. Thanks to member Noordegraaf for this excellent publicity in Europe.

I.L.S. System of FAA. "Vic" Clark



"Vic" Clark first became active as an Amateur Radio Operator in Phoenix, AZ 1933 when he received call W4KFC which he has held since. He served as ARRL Section Comm. Mgr. 1937-38 and Virginia in 1950-52. He was Roanoke Dvn. Director 1967-74 and ARRL First VP from 1974 to 1980. He served as International Amateur Radio Union Reg. 2 Pres. 4-1/2 years travelling to more than 40 countries on behalf of amateur Radio during WARC 79 preparatory period. Served on WARC team in Geneva. Vic holds an extra class license and has qualified for DXCC

VICTOR C. CLARK W4KFC

(Continued from Page 25)

patterns. We "flew" the ILS endlessly in CAA/FAA aircraft piloted by our Washington office flight inspection services . . . Art Jenks, Al Morrissey, et al . . . smoothing out bumps in the glide path, straightening localizer courses, and assessing the systems for possible involvement in aircraft accidents. To my knowledge, the ILS has never been identified as a causal factor in any aircraft landing accident to this day . . . notwithstanding its critical function in guiding aircraft to the ground under a host of weather conditions and in near zero visibility.

During the late forties and early fifties, the group concerned with the ILS program was close-knit and dedicated to its task. Our work brought us in close contact with hundreds of design engineers in a host of manufacturing plants all across the country, and with CAA/FAA field personnel concerned with the installation, maintenance and operation of the ILS.

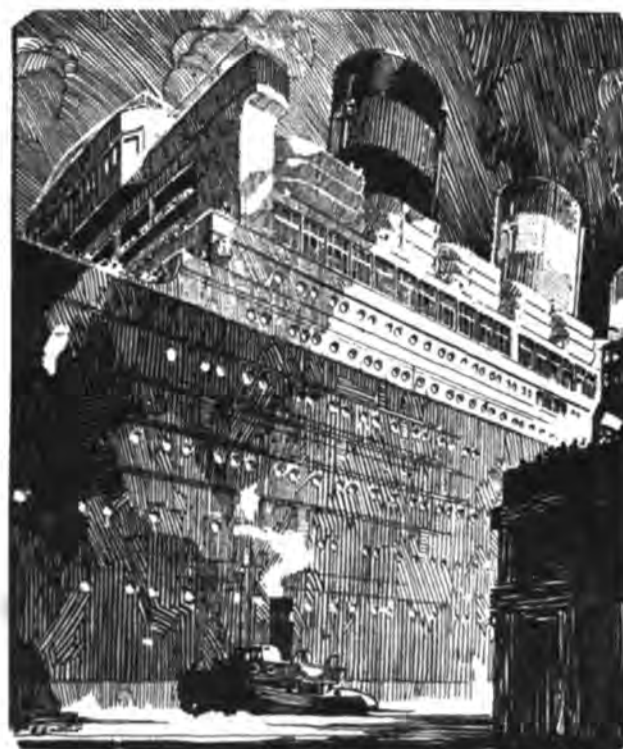
It was not at all unusual for us to work evenings to finish an important task; travel was ordinarily accomplished in off hours or on weekends so as to be on hand at a temporary duty station at the opening of business. Overtime pay was unheard of, and per diem allowances barely sufficient to meet expenses. Yet, there was persistent enthusiasm, a sense of accomplishment and pride in the work of the group . . . quite different from the way government employment is characterized in many areas today.

Looking back, I consider myself fortunate to have been associated with an enterprise so closely related to the growing airlines industry and changing transportation patterns of the time. It was demanding and fraught with the unique anxieties that go with the business of providing safe vehicular navigational passage. We always felt that we were operating near the forefront of technological development, had ready access to most of the country's experts in the field, and were, in turn, hosts to engineers from all over the world seeking to learn from our experience.

Personally, I always considered myself to be a terrible engineer. But I am proud to have been able to sit in the stern for a time and to cheer on a great crew.

A tip of the hat is appropriate to some of those in our earlier top management. Their vision and energy guided our programs through the bureaucratic maze, securing the necessary approval and funding, and establishing practical implementation programs . . . folks like Joe Tippets, Pete Caporale, Si Clark, Bill King, Henry Metz, Howard Stokes, and Ed Smith . . . when you're riding an airliner down through the gloom in heavy weather . . . their hand is on the stick, too.

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A Million Words
6 Volumes

FRANK OSBORN BRAYNARD

We are happy to honor "Frank" who is one of the few of the Society's Honorary Members. [H-18]. He has been a lifelong professional artist. His work as an author includes more than a dozen published books, countless encyclopaedia pieces and magazine and newspaper articles. His work as a publicist range from his three-year campaign to find the wreck of the first steam ship SAVANNAH, to his campaign to honor her by naming the first nuclear ship after this pioneer liner, to the creation of the first Operation Sail in 1964 and finally the planning and carrying out of OPSAIL 1976, major event of the American Bicentennial celebration.

Perhaps his greatest project has been the completion of his set of six books on the world's greatest ship, the S.S. LEVIATHAN. This, in my opinion, is one of the finest sets of books on a marine subject that I have ever seen. They are not only beautiful to look at but only an individual with Frank's background — artist, author, publicist could have produced such a complete and well illustrated series which I am sure, due to limited editions published will become a 'collector's item' with great appreciation in value. The set, to those in the Society are priced at \$250.00 and the few remaining sets can be purchased from Mr. Braynard direct. His address is 98 Du Bois Avenue, Sea Cliff, NY. 11579. If you wish them autographed, mention your membership number to Frank. There is extra charge for shipping and of course tax in New York State. I personally recommend this fine set. Frank has furnished the Society with a complimentary set for its Library. W.A.B.

Thorn Mayes



Historical Pickerill Letter



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February 26, 1954

Dr. L. S. H. Baird
2716 Bagley Avenue
Los Angeles 34, Calif.

Dear Doctor Baird:

I have your letter of February 22nd in which you mentioned several pioneers in the radio industry and I am happy to give you what information I can regarding them.

Mr. Clifford D. Babcock was superintendent of the United Wireless Telegraph Company's factory in Jersey City for several years, but when that company was taken over by the American Marconi Wireless Telegraph Company on April 1st, 1912, he went to Aldene, N.J. where he was superintendent of the Marconi factory. His assistant in both factories was George Hayes, a former engineer with the General Electric Company in Schenectady. Mr. Hayes went to Buenos Aires, Argentine in 1922 to act as foreign representative of the RCA in Argentine and has been there ever since.

It is my understanding that Clifford Babcock died shortly after World War I, in the early 1920's. You could get all information regarding him by writing to George Hayes, % RCA, 30 Rockefeller Plaza, New York City, requesting that the letter be forwarded to him. While Mr. Babcock and I were close friends, I am sure that Mr. Hayes could give you much more information about him.

I hear Irving Vermilya quite often on his ham set W1ZE over on Cape Cod. His address is Mattapoisett, Mass. I have known Irving since 1908 when he was in high school at Mount Vernon, N.Y. He is now a grandfather with four grandchildren. Irving was remarried only last year. I don't know what Carl Dreher is doing now since he left RCA.

I also knew A. E. Jackson very well back in 1908 when he was one of the operators at the old "DF" Manhattan Beach station on Long Island; another one of the operators who worked there with him was Dunn White who died many years ago. At that time I was in charge of the "WA" station on the roof-garden of the old Waldorf-Astoria hotel.

Yes I came East in December 1907 with Colonel C. C. Wilson, who became president of the United Wireless Company after Abraham White. Prior to that I was with the American DeForest Wireless Telegraph Co. in Colorado, later renamed United Wireless Telegraph Co.

Starting in March 1905 I assisted Charles B. Cooper build several stations in Colorado which was the world's first inter-city wireless system. The stations were at Denver, Boulder, Fort Collins, Colorado Springs, Pueblo, Trinidad, Leadville and Cripple Creek (station on mountain at Altman) all in Colorado, also a station in Cheyenne, Wyo.

Later in 1905 Robert H. Marriott joined the company as assistant to Mr. Cooper and I became manager of the Colorado Springs station, where I remained for 2 1/2 years. I was also at the Boulder and Denver stations. Marriott came to New York in 1909 and we were very close friends all through the years. He died at his home in Brooklyn in October 1952, leaving a wife and three married daughters. He was the first president of the I.R.E. Yes I know about the early radio station he built on Catalina Island and the one at San Pedro.

I knew J. Andrew White for a great many years, ever since he joined the old United Wireless Co. as press agent, then later with the Marconi Co., later when he published the Wireless Age, then when he became the first radio announcer around New York over at the Dempsey-Carpentier fight at Boyle's Thirty Acres in Jersey City. I haven't seen him for years. I also knew Frank Sammis very well when he was Chief Engineer of the Marconi Company and we were both in the head-office in the Woolworth Bldg. in New York in 1912-13 & 14.

Regarding the demise of the old United Wireless Telegraph Company; it was taken over by the Marconi Wireless Telegraph Company of America, on April 1st, 1912, and the general offices moved from 42 Broadway, NYC, to 27 William Street, (Lord's Court Bldg), New York. In 1913 the offices were moved to the



RADIO OFFICERS - SS. LEVIATHAN (L-R)
[E.N.Pickerill-Chief][A.C.Tamburino-1][R.J.Green-2][H.F.Bollendon-3]
[C.R.Underhill-4][George Sinclair-5][Wm.Kelly-Messenger]

newly built Woolworth Bldg., at City Hall Square. Up to the time it was taken over by Marconi, Bob Marriott was the only scientific engineer in its employe. I understand that Harry Shoemaker died in Portchester, N.Y. in the 1920's, where he had a radio factory and built some apparatus for the gov't during World War I. I saw his daughter Mildred back in the late 1920's, when I was Chief on the Leviathan. I knew her Dad (Harry) for many years. Donald McNicol died last December, I saw him only a few months before he died and the years were showing on him at that time. I saw George Clark only a few days ago and the years are also showing quite heavily on him. His address is 349 East 49th St., Apt. 3/T, New York 17, N.Y. Charles B. Cooper's address is 2646 Wynsum Avenue, Marrick, L.I., N.Y. He is now 72 years old, had a heart attack over a year ago and had to retire and sell his radio business. I also saw Arthur H. Morse recently, his address is 4035 Ithaca Street, Apt. 4-X, Elmhurst 73, L.I., N.Y. I hear from Ed Raser quite often. I also see Lloyd Espenschied occasionally, also John V. L. Hogan who is President of the Hogan Laboratories, 155 Perry Street, New York, 14, N.Y.

You mentioned the old Marconigraph. I have quite a number of copies of it, also a lot of the IRE printed proceedings, starting with Volume I, number 1. Something nobody would ever refer to at this late date, as things in radio have changed so much since they were published.

I receive letters from Lee de Forest quite frequently and you will see by this letterhead that we still have quite a lot in common. He is a great fellow and certainly started something when he invented the "audion."

If there is anything else you think I can help you with, don't hesitate to write and ask me for it. Having been around in this radio game for some time maybe I've got something in the back of my head that you would like to know about.

If you ever worked for any of the various "de Forest companies," or the United Wireless Telegraph Company (the new name taken for the old American de Forest Wireless Tel. Co.) you are eligible for membership in De Forest Pioneers. Quite a number of very old timers who are still on top of the heap in the radio and TV world who are members.

With all good wishes and 73's.

Sincerely,

/s/ E. N. Pickerill

THE

E. N. Pickerill
COLLECTIO



ANOTHER RECORD FOR THE "LEVIATHAN"
Chief Radio Officer Pickerill and his assistant, A. C. Tamburino, are holding some of the 4000 messages sent and received during the vessel's first trip to Europe and back since her reconditioning.

[Radio Broadcast - Oct. 1923]

The Leviathan Breaks
Some Records

ACCORDING to an announcement of the Western Electric Company, the radio apparatus installed on our largest liner has set a new mark for merchant-marine radio. The ship not only broke all previous communication records by transmitting 15,000 words a day, to and from shore, but managed to keep in constant touch with land radio stations from one thousand to thirteen hundred miles away. By means of new apparatus specially designed for it, the Leviathan operated simultaneously, for long periods of time, two different sending and receiving sets. The steamship carries four antennas, two for sending and two for receiving.

Hero of The SS.Republic

CQD CQD CQD DE MKC

MARCONI MARINER, MAY/JUNE, 1961

Wireless Saves 1600 Lives

RELICS OF HEROIC RADIO OPERATOR

Presentation to Peterborough Museum of Jack Binns' Medals and Citations

AN ECHO OF more than half a century ago came back to Peterborough, Northamptonshire, on 11th April, 1961, when medals and citations awarded to Jack Binns were presented to the Peterborough Museum Society in accordance with his wish that this should be done after his death.

The relics were formally handed over by Mr. R. Ferguson, managing director of the Marconi Marine Company, acting on behalf of Mrs. Alice Binns, of New York, and were accepted by Mr. W. J. Adnitt, chairman of the trustees of the Peterborough Museum Society. Guests of the Society at the ceremony included the mayor of

Illuminated testimonial presented to Jack Binns by the Mayor and Citizens of Peterborough



Peterborough, Councillor J. A. Savage; Miss V. A. Binns and Mrs. Bray, cousins of Jack Binns; Colonel Henry S. Taylor, U.S.A.F. base commander, R.A.F., Alconbury; Lt.-Colonel W. E. Gill, T.D., M.I.E.E., telephone manager; and Mr. L. Tait, B.A., chief education officer.

Mr. G. F. Dakin, C.B.E., M.C., M.A., president of the Peterborough Museum Society, took the chair, and trustees and members of the Society were also present. Unfortunately Mr. H. J. Tattersall, who

Diplome d'Honneur presented to Jack Binns by the Société des Sauveteurs de la Seine



Citation presented to Jack Binns by the French Ministry of Marine

was the wireless operator of the rescuing ship—the White Star liner *Baltic*—was prevented by ill-health from attending the ceremony, but sent a telegram to say that his thoughts were in Peterborough on this occasion of tribute to his old colleague.

To Mrs. A. M. Love, who was also present at the ceremony, the presentation held a particular interest. Her late husband, Mr. George Love, when he was telegraph clerk at the Great Eastern station nearly sixty years ago, taught wireless telegraphy—a science then in its infancy—to Jack Binns. After Mr. Binns had left the railway service to join the White Star Line as a wireless operator, he and Mr. Love remained firm friends.

A proud possession of Mrs. Love's is a signed testimonial from the mayor and citizens of Peterborough.

Jack Binns



"CQD" Jack Binns shortly after his rescue from the *Republic* Capt. Sealby (wearing cap) in background

The medals, citations and watch will be placed in a special glass case in the museum.

Mr. Ferguson, who was a close friend of Binns in the early days of his service as a radio officer at sea, also presented to the museum, two books relating Binns' experiences and said that, by his devotion to duty and by the way in which he did everything that was expected of him, Jack Binns was a credit, and would always be an example, to radio officers.

The mayor expressed his appreciation of the gifts on behalf of the citizens of Peterborough, while Mr. Adnitt said that he was very grateful to Mrs. Binns for carrying out her husband's wishes so faithfully—the Society would welcome and preserve the medals in the best manner possible.



Mr. Ferguson handing over the relics to Mr. Adnitt

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Key [SK = Silent Key, SGP = Spark Gap Pioneers, P = Pioneers,
V = Veteran, M = Member, Sparks = Worked at Sea]

- (SK) Ed Raser, W2Z, Radio Pioneer, Sparks, SOWP #35-SGP
- (SK) Bill Gould, K2NP, Radio Pioneer, Sparks, SOWP #565-P
- (SK) Matty Camillo, W2WB, Sparks, SOWP #750-SGP
- (SK) Dare Robinson, WB2EVA, Sparks, SOWP #2284-SGP
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